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ISSUES IN PROVIDING AGRICULTURAL SERVICES IN DEVELOPING COUNTRIES

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I. Introduction

The Agency for International Development (A.I.D.) and other donors have spent substantial amounts during the past three decades to support agricultural development in developing countries. A synthesis paper on investments in agriculture is being produced that will identify the conditions under which agricultural investments in five major areas have been successful or unsuccessful in contributing to broad based agricultural growth in developing countries. For purposes of this study, agriculture is defined as those activities traditionally funded under Section 103 of the Foreign Assistance Act in support of rural production as well as simply agriculture. The funded activities are organized into five main sub-sectors:

1. Asset Distribution and Access
2. Planning and Policy Analysis
3. Technology Development and Diffusion
4. Rural Infrastructure
5. Agricultural Services

A paper on each of these sub-sectors will be written as input for the synthesis paper. The intent of the synthesis paper is to help A.I.D. obtain a clearer understanding of the results of these investments and, in so doing, to assist the Agency's strategic decision-making regarding priorities for future agricultural programs. Each paper is to address six key issues for A.I.D. They can be stated as follows for this paper:

1. Are investments in agricultural services appropriate at all stages of development, or are they most appropriate during the early or later stages of growth?

2. Has successful agricultural development occurred in the absence of investments in agricultural services?

3. What was the rate of return to investments in agricultural services? Did investments in complementary subsectors pave the way for these returns?

4. Is the private or public sector best suited to invest in agriculture services?

5. Among the various agencies or organizations that implement agricultural activities, are some better suited than others in providing agricultural services?

6. Does the U.S. have a comparative advantage in assisting in the provision of agricultural services in developing countries?

The present paper addresses the agricultural services sub-sector which is defined to include agricultural credit and marketing services, including both inputs and outputs. For the purposes of the paper, these services will not include rural infrastructure, research and extension, planning and policy analysis, or asset distribution and access. Each of these is covered in one of the other four papers. Agricultural services will be defined as those related to production agriculture and will not cover some special types of services such as credit and marketing services for microenterprises, or export credit. Credit services will include both loans and deposits. Marketing is defined as the system of markets and related institutions which organize the economic activity of the food and fiber sector of the economy. This system involves information flows, institutional arrangements, infrastructure, organizations, and entrepreneurial or risk taking activity.

This desk study is a review of literature to establish the state of knowledge about agriculture services in developing countries throughout the world. The study uses the evaluation synthesis methodology, which is designed for the "rapid production of information relevant to a specific program and the analysis of large amounts of sometimes conflicting information on the topic" (GAO 1992). Documents from several major international donor organizations and the academic literature of books, journal articles and working papers, and the past experience of the authors are the major information sources used in the study.

The next two sections of this report discuss issues in providing agricultural services and a theoretical framework defining the impact of agricultural services. This is followed by three sections presenting an evaluation of rural financial services, agricultural marketing services and agricultural input marketing services, respectively. The last section discusses the conclusions and implications for future AID investments in agricultural services.

II. Issues in Providing Agricultural Services

A. Rural financial services

Agricultural credit has been viewed as being essential for the expansion of food production, the adoption of new farming technology, and for the improvement in rural income distribution. Many developing countries and donor agencies were preoccupied during the 1960s, 70s, and 80s with expanding agricultural production, especially food grains. The Green Revolution offered hope for breaking through existing production constraints. But the new technologies usually required an expansion in cash outlays by farmers to purchase inputs including new seed varieties, chemical fertilizers, and pesticides. For large farms, this also implied expanded costs for hired labor. Many of the food grain producers were small farmers whose active involvement was considered crucial to tap the new production potential. An expansion in credit for purchasing the new factors of production was

considered key, especially for small producers in light of these high cash costs. Neither the existing informal lenders nor the established formal financial institutions were considered able or willing to provide reasonably priced credit to meet small farmer needs. This view led governments and donors to conclude that credit market failure existed and could be corrected by government intervention through selective policies and projects. This view provided donors with the rationale to support special credit programs, often at subsidized interest rates, to speed the adoption of technology and to expand food production. (See, for example, the rationale given for ADB credit projects in ADB 1993 and the discussion about A.I.D. by Lieberson et al. 1985).

Two types of credit projects were used to support agricultural development. The first can be referred to as a "credit-component" project involving a production package in which credit is tied to the adoption of a package of inputs. Credit is viewed like another input necessary for adoption of the technology. The production packages often specified the amount of seed, fertilizer and credit that each farmer should receive per hectare of crop produced. The implicit assumption was that either the farmer had no savings, or was unwilling to commit them to the new, more risky technology. The second kind of "credit-only" project assumed that reasonable input supplies were available and credit delivery institutions existed, but they needed special incentives to lend to socially desirable groups such as small farmers. This type of project targeted specific classes of borrowers for loans but left to the lenders the actual allocation of funds.

Both types of projects suffered serious limitations as revealed in subsequent evaluations and research. They assumed that the farmers would perceive the new technology to be profitable but they failed to recognize that credit is fungible so that it can be allocated by borrowers to the use with the highest expected return which may not be the new technology. Moreover, loans may simply substitute for the borrowers' own funds or informal finance so the additional use of new inputs may be much less than expected. Evidence from some areas of rapid adoption of Green Revolution technology showed that farmers were willing to use their own savings when they were convinced that the new technology was highly profitable. Furthermore, many projects paid little attention to the sustainability of the financial institutions that supplied credit. Often the projects collapsed when the donor funds were spent. This experience has focused increased attention in recent years on the profitability of new innovations, the secure supply of inexpensive inputs, and the viability of financial institutions serving agriculture.

B. Agricultural marketing services

As countries begin the economic growth process, many changes can be identified that lead to an increase in demand for marketing services. Higher incomes and growing populations mean that consumers will demand more and more marketing services that increase convenience and reduce preparation time, such as cutting and slicing, frozen, canned, packaging, oven ready, and microwaveable. This occurs because the income elasticity of demand for marketing services is higher than for the raw material produced on farms. In

addition, as per capita income increases, the composition of demand for food changes to increased consumption of products with a higher income elasticity of demand and reduced consumption of foods with a low income elasticity of demand. These changes typically mean increased consumption of products such as fruits and vegetables, meat, dairy and processed products and decreased consumption of staples such as potatoes, cassava, and rice. More marketing services are required for these high valued perishable products. Among developed countries the income elasticity of demand for cereals is -0.22, compared to +0.25 and +0.38 for high value foods such as meat, eggs, and fruit and vegetables. In developing countries, the income elasticity of demand for cereals is estimated to be +0.16 and from +0.61 to +1.00 for the high value foods [Sarma and Yeung 1985 and Islam 1990].

Increasing urbanization also leads to an increase in demand for marketing services as populations relocate from rural areas to urban areas. Urbanization through time leads to a population that changes from primarily rural to primarily urban. This urbanization means major changes in the marketing system as more marketing services are required to transport, store, package, and process large quantities of foods from production centers to consumption centers.

Consumers, producers and policy makers frequently view marketing services as unproductive and too costly. The marketing system is viewed as charging the consumer too much and paying the farmer too little for the goods and services provided. The value added from marketing is more difficult for consumers, producers and policy makers to comprehend. One of the reasons for this view is that marketing provides intangible services through the creation of time, place and form utilities rather than the production of a tangible good as in farm production or manufacturing.

Whether markets are competitive or exploitative of consumers and/or producers depends in large measure upon their structure and performance. Competitive markets, generally viewed as having a large number of firms, lead to desirable results in terms of economic efficiency and returns to resources. Monopolistic markets, generally viewed as one firm or few firms, lead to inefficiency and excess returns to economic resources. In developing countries the lack of competitive markets and market failure have frequently been a justification used by governments to intervene in markets. A common form of intervention has been the creation of government owned monopolies that were intended to improve market competitiveness but, the intended objectives were not achieved.

Agriculture, perhaps more than any other business, faces enormous production and price risk due to the inelastic nature of the demand and supply and the effect of natural disasters and weather variability on production. Reduction of price and production risk is an important policy objective of governments in developing and developed countries. Governments intervene in markets to stabilize prices and production for the stated benefit of producers and consumers. Large government purchase and storage programs for grains, and sometimes other products, were created to guarantee minimum prices to producers and

low, stable prices for consumers. These programs encounter many problems of high costs and inefficiency that will be discussed in the marketing services section of this report.

C. Agricultural input marketing services

As countries develop, farms become larger in size, more capital and labor intensive, more dependent on the market place for the purchase of inputs and the sale of outputs. Providing agricultural inputs in a timely and low cost manner becomes increasingly important. Agricultural input services in the form of improved seeds, fertilizer, and machinery, separately or as a package, have been widely used in developing countries to modernize agriculture and improve productivity per unit of land and labor.

The provision of agricultural input services accounts for a major portion of the project assistance of many donor organizations including A.I.D., IDB, World Bank, and others. As discussed in the rural finance section, the objective of many donor credit projects is to finance the farmer purchase of these input packages, especially small farmer financing. Much of the input supply assistance is through commodity import programs, especially for fertilizer and to a lesser extent imported feeds and protein for livestock. Significant but much smaller amounts of funds have been allocated by donors to seed, livestock, animal traction, and machinery input service projects.

The most successful example of innovation and technology is with the provision of Green Revolution seed varieties and the related inputs. Developing the appropriate technology is an issue to be discussed in another report, but how to deliver the technology to producers most effectively is an issue here. Many public sector parastatals, a few private sector options and some combinations of the two have been used to attempt to deliver the input services to farmers. Most parastatal agricultural input marketing services have had very mixed results because of the high cost, inefficiency, poor service and political interference. Input delivery services frequently have problems of inappropriate technology, lack of profitability or untimely delivery. For example, in discussing seed projects in Tanzania and Cameroon, one report concludes that the large amounts of funds spent on those projects is another example of "technological optimism" regarding the returns to the investment when the funds would have had a higher payoff allocated to research to develop better local varieties [Johnston, Hoben, Dijkerman, and Jaeger 1987, p 160].

III. Theoretical Framework Defining the Impact of Agricultural Services

The purpose of this section is to present a simple analytical framework for the analysis that follows about the relationship between investments in agricultural services and agricultural development. This framework is similar to that used implicitly or explicitly in many government and donor projects. There has been a significant change in views over the past 20 years, however, so this section will first present the traditional views followed by some of the newer ones.

A. Traditional Views of Providing Agricultural Services

i. Rationale for special credit projects

The traditional view of agricultural credit was closely linked to early views about the process of technological change and the way that cash or liquidity constraints were perceived to affect farm household resource allocation (David and Meyer 1980). The basic principles can be described most simply by using a production function as shown in Figure 1. Crop yields per unit of land are plotted on the vertical axis and fertilizer inputs per unit of land are plotted on the horizontal axis. All other factors of production are assumed constant. The production function plots expected crop yields as fertilizer use increases. Two production functions are shown. The lower one refers to fertilizer response for traditional crop varieties; the higher one plots what might be expected by using new varieties created specifically to be more responsive to chemical fertilizers.

The demand for fertilizer is determined by three factors: the price of the output or crop, the cost of fertilizer, and the production technology (Norton and Alwang 1993). Profit maximization requires that a farmer should increase the use of fertilizer up to the point where the cost of the marginal input (which is its price in a competitive market) equals the value of the marginal product of the input (the output price times the marginal product of the input). The price ratio lines, P_x/P_y, reflect the relationship between fertilizer and crop prices faced by the farmer. The profit maximizing or optimum use of fertilizer on the traditional variety is at point B with X_0 units of fertilizer applied per unit of land, or at point Y with X_1 units with the new variety. The importance of the productivity increase of new technology is reflected in the increase in optimum fertilizer use with no change in price ratio. The Figure could have been drawn so that a reduction in the relative price of fertilizer would have been required in order to induce farmers to use the new variety. This new price relationship could also induce the development and adoption of newer varieties giving an even larger fertilizer response (Hayami and Ruttan 1985).

The traditional view of credit "need" arose because of a concern about the ability of farmers to pay the cash costs implied in buying and optimum levels of fertilizer. If a farmer had cash to buy less than X_0 units of fertilizer, then production and farm income would not be maximized. Both the farmer and the nation would lose. Furthermore, it might be rational for the farmer to adopt no new technology. It was believed that market failure existed in credit markets because formal lenders were too risk averse to make socially desirable loans to farmers, and informal lenders charged usuriously high interest rates. This understanding of the problem led to the creation of integrated production packages in which credit was treated as an input along with seed, fertilizer, and other inputs. The credit was provided through special credit lines or special institutions and was often supervised to insure that the farmer properly used the technology and credit. Similar types of arguments were made to rationalize projects designed to provide farmers with medium and long-term credit to purchase larger capital inputs. Fertilizer and interest rate subsidies were justified as necessary to temporarily increase profitability in the early stages of the adoption process

when farmers were just beginning to learn the value of the new technology. Later, interest subsidies were rationalized as a way to compensate farmers for the urban bias of many food price and wage polices. It was also expected that credit targeted for special classes of borrowers, such as small farmers or the rural poor, would help improve income distribution and reduce poverty (Adams and Graham 1981).

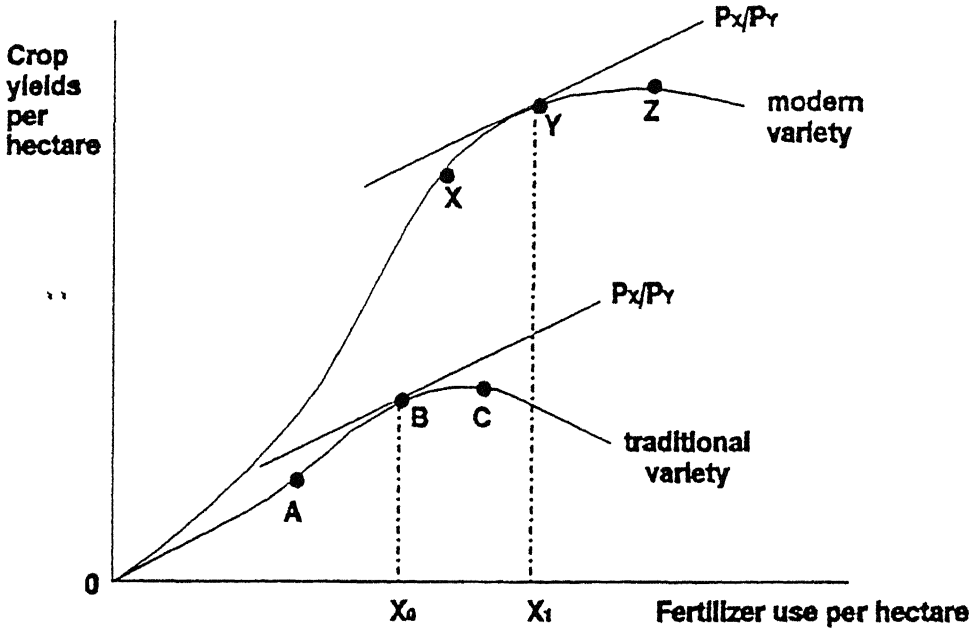

Figure 1. Production Function Relating Fertilizer Use to Crop Yields

ii. Impact of a reduction in marketing costs

Marketing costs can be analyzed within this same framework. Lower marketing costs increase the net price that farmers receive for their output. A reduction in the marketing costs is reflected by a clockwise rotation of the price ratio line in Figure 1. Such a reduction, therefore, would enable farmers to increase production by moving along the production function to a higher level of output (toward points C or Z in Figure 1). The benefits obtained from reducing marketing costs will be divided between lower prices to the consumer and higher prices paid to the producers depending upon the price elasticities of demand and supply for the product. The more inelastic the supply relative to the demand the greater the share of the marketing cost reduction that will be passed along to the producer in the form of better prices. In terms of the producer, a reduction in marketing costs may increase the output price or reduce the input price.

Several factors may lead to a reduction in marketing costs that will improve the price ratios for the individual producer. Any investments that improve pricing or operating efficiency in agricultural markets will, ceteris paribus, reduce marketing costs. For example, infrastructure investments that reduce costs of transportation and communication, legal and institutional reforms that promote more efficient marketing, information services that improve firm decision making, new technologies that reduce costs of processing and handling, can all reduce marketing costs.

As incomes increase, consumers demand more marketing services such as increased processing, packaging, and handling and the associated marketing costs will increase causing the farmers' share of the consumer food dollar to decline. These costs consist mainly of physical distribution costs, service costs and profits. As can be seen in Table 1, marketing costs vary substantially by commodity. They also vary by country for the same commodity due to differences in income, geography, infrastructure and marketing systems, for example. One study found that marketing costs are larger in several African countries than in Asian countries because of higher transport costs due to poorer infrastructure and larger country size [Ahmed and Rustagi 1987].

TABLE 1. Marketing costs and margins for major food items in selected less developed countries

Major food items	*Marketing costs and margins as percentage of consumer price*	*Cost items as percentage*
Cereals		
Rice	30-60	9-18 (transport costs) 9-18 (milling costs) 12-24 (other costs such as assembly and retailing)
Wheat	60-80	The largest part of the gross margin was taken up by the baker's and retailer's margin
Maize	40	Major cost items were assembly and milling costs
Livestock and meat		
Livestock meat	20-45	5-11 - retail costs (lower income countries) 10-23 - retail costs (higher income countries)
	20-50	Assembly costs
	1-3	Slaughtering costs
Eggs		
Eggs	20-30	10-15 (retailing costs) 10-15 (assembly and wholesaling costs)
Potatoes		
Potatoes	20-40	20-30 (retailing costs) 60-70 (assembly and wholesale costs including transport)

Source: Kaynak

In the U.S. the farmers' share of consumer food expenditures has declined steadily through time and is currently about 25 percent for food consumed at home and 16 percent for away from home consumption [Rhodes 1993]. In many developing countries the farmers' share is higher than in the U.S. (40 to 50 percent of the consumer expenditure) but the same declining trend can be observed. This declining farmer share of consumer food expenditure can be expected to continue as countries develop. It is important to bear in mind that a declining trend in this share does not mean that the marketing system is inefficient or that farming is unprofitable. Technical progress that increases productivity generally will result in declining real prices per unit of output. However, much government intervention in markets is predicated upon the "high marketing costs" and declining farm share only to find out that the services must be performed by someone and that governments frequently perform the services at higher cost than the private sector.

iii. Traditional view of market failure and government intervention in input and output markets

Prior to the 1980s, market failure was viewed as a primary justification for government intervention in agricultural credit, output and input markets. The continued poverty, income inequalities, hunger, food shortages, low productivity and lack of modernization of agriculture as well as other sectors of the economy were considered as evidence that markets had failed to produce the desired economic growth in many countries of Africa, Asia and Latin America [Reusse 1987]. Problems of small farmer access to markets, slow adoption of new technology and high marketing costs were cited as indicators of input and output market failures [World Bank 1990 and 1991, and Wolgin 1990].

The market failure view was especially popular among the socialist oriented governments in power at that time because it complemented much of what the leaders wanted to do to reform the economy. They thought government could do much better than the market place at running the economy to achieve economic growth. These governments, often assisted by A.I.D. and other donors, proceeded to intervene in markets in a wide variety of ways to correct the perceived failures of the market economies in their countries. In many countries the degree of government intervention reached every sector of the economy. Governments nationalized many of the marketing functions in domestic and foreign trade in sectors such as agriculture, manufacturing, banking, insurance, and housing. This was often done through the creation of parastatal companies that had monopoly control of the entire sector. The governments passed laws and regulations to control prices, interest rates, exchange rates, rental rates, marketing margins, product shipments, etc. All this government intervention in markets created a rigid, centralized, bureaucratic system that had great difficulty operating its "businesses" efficiently [World Bank 1991].

B. New Views of Providing Agricultural Services

i. New view of rural financial markets

The traditional view of agricultural credit came under criticism as early as the 1973 A.I.D. Spring Review of Small Farmer Credit (Donald 1976). The early studies suggested that the special small farmer credit projects did not have the expected impact, and there was evidence of unexpected negative consequences such as the concentration of loans and a weakening of financial institutions involved in the projects. These and other criticisms that are discussed in detail below gave rise to what is now called the new view of rural financial markets.

The next important comprehensive attack of the traditional view and the appearance of some ideas that eventually became known as the "new view" occurred in the Colloquium on Rural Finance cosponsored by A.I.D. and the World Bank in Washington D.C. in 1981. The background papers and results of the Colloquium discussions were published in Adams, Graham and Von Pischke (1984). Papers by Adams and Graham (1981), and Adams and Vogel (1986), the book by Von Pischke, Adams and Donald (1983) and the book by Schmidt and Kropp (1987) made important contributions to developing the new view. Many subsequent publications have challenged aspects of the new view and raised additional issues about the problems of financial markets in developing countries.

The new view argued for a fundamental change in the way that governments and donors use finance to support agricultural development and how credit projects should be evaluated. The changes included doing much less targeting of loans, more flexible interest rates for loans and deposits, more emphasis on deposit mobilization, less concessionary lines of rediscounting from central banks, and more attempts to reduce transaction costs for borrowers rather than trying to lower interest rates on loans. It was also argued that projects should be less concerned about the difficult task of measuring impact on borrowers, but rather focus on how projects contribute to the viability of financial institutions and the performance of financial markets.

Although there are still debates between advocates of the traditional and the new view, the new view generally has prevailed. Many subsidized agricultural credit projects have disappeared, there is less targeting of loans, interest rates are more flexible, more emphasis is placed on deposit mobilization and the efficiency of financial institutions, and projects are evaluated on their contribution to the development of sound financial institutions and markets. Studies and evaluations spend less effort on measuring impact on borrowers and more attention to analyzing the performance of the financial system. More attention is being given to complex design issues in developing policies, technologies, and organizations that can survive and be efficient when serving farmers in the difficult circumstances found in developing countries.

ii. New view of government failure in input and output markets and creation of open competitive markets

The record of government failure and general dissatisfaction with government intervention in input and output markets is readily observed by the comprehensive changes being implemented in many countries today. Many of these changes are described in the next several sections and more generally in the development literature cited at the end of the present report [Krueger 1978 and World Bank 1991].

State intervention in agricultural marketing systems has generally failed to contribute to sustained economic growth and failed to solve the problems of poverty, food shortages, low productivity, etc. that plague many developing countries. Most of the government created parastatal "businesses" failed to perform and are now in various stages of bankruptcy and closure. In several cases such as Nicaragua and Mozambique, the countries have lost 15 years or more of economic growth and are poorer relative to other countries than in the early 1970s. Other countries such as Uganda and Ghana had negative growth rates for several years in this same period.

The new view represents the creation of open competitive markets with more distinct roles defined for the private sector and for government [Wolgin 1990 and World Bank 1991]. The role of the private sector should be dominant in production and distribution in order to realize economic efficiencies and stimulate growth. The role of the state (often neglected in the 1970s and 1980s) is to ensure a correct environment for private sector business operation and prosperity. Many developing countries are conducting structural reform programs that transfer ownership of many previously nationalized assets back to the private sector. Laws and regulations are being changed to eliminate monopolies and encourage competitiveness. Farm land, import and export businesses, processing companies, banks, marketing services, and input services are being privatized (World Bank, IMF, and A.I.D. structural adjustment loans are being used to facilitate the reforms).

Demand and supply in a competitive market are being used to determine prices that guide the allocation of resources and the returns to the resources. Prices, interest rates, exchange rates, movement of goods, imports and exports are becoming free of government control. The private sector is investing in existing businesses and investing in new opportunities.

In the new view governments realize their comparative advantage and their resource limitations. It is argued that governments need to focus on creating an economic and political environment in which the private sector has a major role in the performance of the economic activities of the country. The governments need to focus on creating the appropriate conditions for private firms to operate. In the case of input and output markets this means the government should promote competition in markets, emphasize the provision of facilitating functions such as infrastructure, information, rules and regulations, contract enforce-

ment, grades and standards, and research that have large public good components. This new view places the performance of most economic activity in the private sector.

IV. Evaluation of Rural Financial Services

A. Importance of rural credit programs

Credit programs and projects represent a major source of governmental support to agriculture in many developing countries. They have also been heavily supported by donor agencies. A huge amount of subsidies have gone to farmers and financial institutions through credit projects.

The World Bank has been the largest provider of external funds for agricultural credit projects. A recent World Bank Review (1993d) concluded that of the 10 developing countries with the largest populations (excluding Europe), the Bank has played an important role in supporting the dominant agricultural lending agency in every country except Nigeria. Altogether 94 countries received Bank funding for agricultural credit from FY1948 to FY1992. The amount approved in 683 projects totalled $16.5 billion measured in current dollars. This represented about 26 percent of the Bank's total agricultural lending during the period. About 40 percent of the funds were concentrated in just three countries (India, Mexico, and Brazil). Over 80 percent of the funds were allocated to projects in which credit was the chief disbursement, while the remainder went to projects with credit as a component.

A.I.D. has a long history of supporting agricultural credit. At the time of the A.I.D. Spring Review of Small Farmer Credit in 1973, it was estimated that A.I.D. had channeled more than $700 million into agricultural credit projects since 1950 (Donald 1976). An important characteristic of these projects was their small farmer orientation. Between 1973 and 1985, A.I.D. allocated an additional $300 million to agricultural credit making a total of slightly over $1.0 billion between 1950 and 1985. These estimates do not include the large amount of technical assistance provided in addition to the capital transfers (Chew 1987). Adams (1990) estimated that for the Latin American region credit was involved in projects amounting to about $350 million in the 1942-70 period, and over $1.5 billion in the 1973-90 period. It appears, therefore, that the lion's share of A.I.D. credit funds went to this region.

A significant portion of the Inter-American Development Bank (IDB) portfolio has also gone into agricultural credit projects. During the 1970-82 period, over $1.2 billion went into agricultural credit in over 60 loans. Additional projects included credit as a component (IDB 1984). The pipeline for 1983-86 included 13 loans in an amount of $640 million in addition to another 35 loans for $900 million in agricultural or rural development programs which usually contain sizable credit components.

The Asian Development Bank (ADB) began its agricultural credit operations in 1970 and by the end of August 1991 had approved 72 projects for a total of almost $1.4 billion. Just over $1.0 billion went to 36 agricultural credit projects providing credit to crop farmers and cooperatives for the acquisition of equipment. The remaining projects included agricultural credit as a component in activities supporting the fisheries or livestock sectors. Over 60 percent of the credit projects went to 13 market economy countries in the region (ADB 1993).

B. Common characteristics of credit projects and policies

Donor support originally funded a combination of "credit-only" and "credit component" projects. The credit component type was particularly important in early projects designed to stimulate farm production through the adoption of a package of production practices. A.I.D. projects in the mid 1950s, for example, first began with technical assistance. Credit was expected to play a secondary and supplemental role. Cooperatives were often promoted as the credit vehicle because of the influence of technical advisors drawn from the U.S. Department of Agriculture and cooperative organizations (Donald 1976 and Adams 1990). With the advent of the Green Revolution, many projects specifically identified a package of inputs that farmers should use if they were to obtain credit. The credit was often supervised to assure that the recommended inputs were properly used. Later when the new inputs were assumed to be readily available and credit institutions were in place, credit-only projects were designed to stimulate lending to specific clientele groups, such as small farmers, who were frequently unable to borrow from lending agencies. In more recent years, some "institutional-strengthening" projects have been funded to strengthen financial institutions with on-lending being a secondary objective.

The rationale for donor and government involvement in agricultural credit has often been based on perceptions of farmers' "needs." Lieberson, et al.(1985) summarized this rationale for early A.I.D. projects as follows: "One reason for the emphasis on credit was the assumption that access to credit was a critical constraint to the adoption of improved inputs and modern technologies. Modernizing agriculture requires large infusions of credit to finance the use of purchased inputs such as fertilizer, improved seeds, insecticides, additional labor, etc. Because savings in traditional agriculture tend to be relatively small at the initial stages of development, increased demand for working and fixed capital must largely come from an increased supply of credit. Small farmers have meager internal resources and, therefore, are most in need of production credit." (p. 17).

The perception of unmet credit needs led policymakers and donors to increase the supply of loans to "lead" agricultural development. The following summary characterizes many of the features of government and donor funded agricultural credit programs in developing countries:

1) Attempts to increase the supply of funds available for lending to agriculture through:

- portfolio quotas or targets for existing lenders,
- the creation of specialized financial institutions to service agriculture,
- the provision of grants and subsidies for non-financial institutions (ministries, departments, institutes, NGOs, PVOs),
- central bank rediscount programs, often funded by donors,
- mandatory placement of bank and/or private sector deposits in specialized lending institutions, and
- nationalization of banks that failed to make the desired amount of loans.

2) Reduction in the interest rate on loans made to agriculture through:

- interest rate ceilings on loans with the lowest rates set for the smallest/poorest borrowers,
- low interest rates charged by the central bank on refinance funds,
- encouraging banks to cross-subsidize by charging higher rates to non-priority borrowers in compensation for lower rates to priority borrowers, and
- direct government interest subsidies to lenders.

3) Attempts to reduce lending risks and costs through:

- detailed targeting of loans including requirements about production practices and input use required of borrowers,
- crop and loan guarantee programs,
- creation of joint liability through lending to groups of borrowers, and
- technical assistance to lenders to help improve institutional efficiency.

Serious doubts about the design and impact of the traditional agricultural credit projects began to emerge as early as the 1973 A.I.D. Spring Review (Donald 1976). Many subsequent evaluations and academic studies since then have documented the shortcomings of the "credit needs" approach and have argued instead for a broader "rural financial markets"[1] approach to the development of rural financial systems. The earliest studies tried to assess the impact of credit on the borrower's input use, production, and income. Impact analysis was fraught with difficulties, however, caused in large part by the fungibility of credit (David and Meyer 1980). Furthermore, this analysis usually ignored the frequent negative impact of the credit project on the financial institution leading to the paradox of successful credit projects but failing financial markets (Adams 1988a).

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[1] Dale Adams may be the first person to use this terminology in the Ohio State University Newsletter on Rural Financial Markets and Policy, No. 1, Oct.-Dec., 1974.

The next sections summarize the key findings of the studies and evaluations that have analyzed the impact of many traditional credit policies and projects on borrowers, lenders, and national economies. Although there is considerable consensus on the impact of credit in the literature listed in the references, there are exceptions. An important example is the World Bank Review (1993d) which reflects a continuation of the debate between World Bank agricultural projects and financial markets staff. Surprisingly, its recommendations are inconsistent with the World Bank's own 1993 Handbook on Financial Sector Operations. The conclusions and recommendations found in the recent literature of A.I.D., IDB, and ADB, however, are generally consistent with most academic studies.

C. Impact of credit projects on farms

The first place to look for credit impacts is on farms because many projects were specifically designed to influence farm operations. Clearly identifying and measuring these impacts is difficult even with new methodological tools. The basic problem is that the analysis requires comparing what a farmer did when he received a loan with what he would have done without the loan. The latter alternative, of course, is not observable so the researcher is required to use some technique to approximate what cannot be directly measured. One frequently made simple assumption, clearly inappropriate, is that none of the actions undertaken after receiving a loan would have occurred without it. This implies, for example, that a farmer would have adopted none of the new Green Revolution seed-fertilizer technology without receiving a loan. But since some farmers adopt new technology without receiving formal loans, obviously some formal loans simply substitute for own funds or informal loans. The "additionality" that can be attributed to formal lending, therefore, is less than the amount of total loans. Additionality is also reduced when borrowers divert loan funds to more lucrative or desirable alternatives. The fungibility of credit makes it extremely difficult to clearly determine the true farm level impact. The problem is intensified when interest rates are highly subsidized on formal loans so it is more attractive for borrowers to borrow and substitute or divert the funds (David and Meyer 1980; Von Pischke and Adams 1980; Von Pischke 1983). This attribution problem must be recalled when evaluating the following discussion about credit impact.

A review of some of the early impact studies conducted by David and Meyer (1980) concluded that the impact of short-term credit programs on the new seed-fertilizer technology was unclear. The technology was recognized as being highly divisible so farmers with varying financial constraints could adopt it but at different points along the modern technology function (i.e somewhere to the left of the profit maximizing point, Y, in Figure 1). On the other hand, medium and long-term credit might be more closely associated with changes in production because these loans may be used to finance the purchase of large, lumpy investments that are more difficult to self-finance.

The 1993 World Bank Review tried to assess the farm impact of bank loans based largely on the experience reported in 41 credit projects completed in the last 5 years. The general impression reported for these projects is favorable, but this conclusion is based on

an admittedly weak economic analysis. Some cases seem clearer than others. The rapid expansion of shallow tubewells in northwest Bangladesh, for example, was associated with World Bank funding for the project. The rapid expansion of farm mechanization in central and southern Brazil in the 1970s and 1980s appears to be another example of farm level impact of a massive expansion of agricultural credit at heavily subsidized interest rates (also see Barros 1980).

The experience of selected countries is revealing. The Philippines implemented the large Masagana 99 program with A.I.D. support beginning in 1973 to expand rice production following disastrous typhoons and to bolster the country's land reform in rice growing areas. The program involved a package of inputs, supervised credit provided without collateral, and subsidized funds rediscounted to lenders by the central bank. The lending program reached as many as 530,000 farmers at one time, roughly one-third of all the rice farmers in the country, but the number fell to 70,000 by the early 1980s due to accumulated defaults. Rice self-sufficiency was attained for the first time during the first years of implementation. An evaluation coauthored by one of the government officials involved with the program (Sacay, Agabin and Tanchoco 1985) summarized the debates that exist about how much impact the program can claim on rice output which was already increasing due to farmer adoption of the new technology. The authors conclude that Masagana 99 should not have expanded as quickly as it did and the program could have employed much less credit thereby minimizing some of the adverse effects on the financial institutions described below.

India is another country that has received large amounts of donor assistance to massively intervene in rural credit markets in pursuit of production, income and poverty alleviation objectives. A complex structure of institutions has emerged that is tightly administered with targets, quotas and interest rate controls (Reserve Bank of India 1989). About 30 percent of the rural families have obtained access to institutional credit, but the system performs poorly in mobilizing deposits, efficiently lending, and recovering loans. Huge subsidies are required to prop up the system and the only way some financial institutions can survive is to cross-subsidize rural loans by charging nonpriority customers higher rates.

Studies have been conducted to try to quantify the impact on agriculture in India of this massive credit intervention. Binswanger, Khandker and Rosenzweig (1989) analyzed how agroclimatic endowments and quality of infrastructure influenced the location of rural commercial bank branches. Then they analyzed the impacts of bank expansion and interest rates on agricultural performance. The rapid bank expansion was shown to have a large impact on fertilizer demand, and on investments in tractors, pumps, and milk and draft animals, but contributed to only a 3 percent increase in aggregate crop output over the 1960/61 to 1981/82 period. Interest rates, however, were found to have little impact on fertilizer demand or aggregate output, but clearly reduced long-term investment. It was concluded, therefore, that the most important impact of agricultural credit policy was through the expansion of the commercial banking system rather that through interest subsidies. In another study, Khandker and Binswanger (1989) included Cooperative Societies and Land Development Banks as well as commercial banks in an analysis to determine the

effect of expanded total formal credit supplies. This study also showed that formal credit played an important role in fertilizer and investment demand, but little direct effect on crop output. But formal credit was found to make a significant effect on the growth of the rural nonfarm sector.

Another way to assess credit impact, especially in the countries where loan volumes reached large levels and were highly subsidized, is to study aggregate production trends after the credit supplies and/or interest subsidies are reduced or eliminated. If an expansion in credit made a large impact on production, it is reasonable to expect that production should fall following a decline in credit. In practice it has been difficult to clearly identify any sharp short-term production declines due to credit shrinkage. (For example, see Vogel and Larson 1984 for Colombia, and Araujo, Shirota and Meyer 1990 for Brazil). This does not necessarily demonstrate a lack of impact, but it suggests that farmers have been able to find ways other than through subsidized formal credit to finance their operations when credit programs were changed or terminated.

An issue of potential concern is that the use of subsidized credit targeted to specific enterprises or capital inputs would lead to resource misallocation (Mellor 1966, p. 325). This could occur at the macroeconomic level if entrepreneurs were induced through cheap credit to invest in enterprises in a subsector that otherwise was uneconomic. It could occur at the microeconomic level if farmers were induced to utilize uneconomic combinations of capital and labor. This was a special concern when subsidized loans were targeted for specific capital inputs such as tractors and machinery. For example, Vogel (1984) noted that subsidized interest rates in Costa Rica could have influenced farmers to replace labor on dairy farms by acquiring electric milking machines. Adams and Gonzalez-Vega (1984) explored this concern and concluded that because of fungibility the firm level distortion question is not likely to be as serious in practice as suggested in theory.

Some empirical studies have attempted to analyze the issue. The World Bank Review (1993d) tried to assess the possible resource allocation effects of credit projects it financed but the data available were weak. The Review noted that in the period 1978-85 the rapid expansion in rural lending in Brazil was not matched by a commensurate increase in farm production. The problem was caused by substitution and diversion of formal loans by "urban cowboys" attracted to borrowing by loans inadequately indexed for inflation. When the interest index was raised to more fully reflect inflation, the credit program served "real" farmers whose apparent intention was to invest in farm enterprises. The evaluation did not discuss, however, if the additional investments, whether made in or outside agriculture, were directed towards otherwise unprofitable enterprises due to the cheap interest rates. A subsidized interest credit project in Yugoslavia was reported to have encouraged overinvestment in agroindustry resulting in substantial excess capacity. A moderately subsidized credit project in Pakistan was found to have not accelerated tractor use beyond their economic return, nor did it encourage excessive displacement of agricultural labor. On the other hand, reports covering credit projects in Morocco and

Tunisia suggested that oversized tractors may have been acquired by small farms because of subsidized loans.

An analytical problem in clearly assessing resource allocation effects of cheap credit was noted in the Review. A credit project in Korea was credited with contributing to an overexpansion in the construction of greenhouses for horticultural production. It was argued, however, that the problem was not largely due to cheap credit, but rather to the country's tariff policy which protected producers from the competition of foreign suppliers. The effect of credit is difficult to disentangle from the effects of other policies. Most non-academic research does not use robust enough data or methodologies to separate these effects and this problem is evident in much of the World Bank's effort to assess the farm level effects of its projects.

A more robust analysis was conducted in a time-series study of district level data in India. Khandker and Binswanger (1989) concluded that the additional capital investment that occurred because of increased formal credit contributed more to a substitution of capital for agricultural labor than for increasing crop output. They did not assess the impact of interest rate subsidies. However, because some of the job creation in the nonfarm sector was attributed to agricultural credit, there was a positive effect on agricultural wages which contributed to the reduction in farm labor use.

More rigorous research is needed before concrete conclusions can be made about the effects of cheap credit on resource allocation. The limited analysis available suggests that the problem may not be as serious as some theorists expected, but highly subsidized loans targeted to specific capital investments may stimulate uneconomic investments and may alter farm level capital-labor ratios, especially in highly inflationary environments where machinery may be purchased as an inflation hedge.

Another important concern about the cheap credit projects of the past was their impact on income distribution. Part of the rationale for subsidized credit targeted for small farmers has been to improve income distribution. Gonzalez-Vega (1984) developed his "Iron Law of Interest Rate Restrictions" to explain how interest rate ceilings on loans would likely lead to credit rationing by lenders so that the rich rather than the poor would receive most of the subsidized funds. The early empirical research on the income distribution effects of subsidized loans focused on Costa Rica and Brazil. The results for these two countries showed that the ownership of farmland was more concentrated than income, but the distribution of agricultural credit was even more concentrated than land ownership.

Vogel (1984) estimated that the total value of subsidies received by borrowers of agricultural credit in Costa Rica in 1974 amounted to almost 20 percent of agricultural value added. The largest ten percent of bank agricultural loans accounting for 80 percent of the total loans made in 1974 went to large farmers so they received most of the interest subsidy. These large farmers already represented the wealthiest persons in the country so the interest subsidies aggravated rather than improved the income distribution problem.

The Brazilian experience is important to analyze because agricultural credit has been an important part of the country's agricultural development strategy. Formal agricultural loans expanded from less than 15 percent of agricultural GDP in the early 1960s to a high of 84 percent in 1975. Interest rates were usually less than they would have been if market-determined, and usually negative in real terms. From 1970 to 1985, the annual interest rate subsidy generally varied from less than one percent of agricultural GDP to almost 20 percent in 1979 and 1980. The 1970 and 1980 Census data revealed that relatively few small farmers reported receiving formal loans, so as in Costa Rica most of the interest subsidy went to the wealthiest farmers, thereby worsening the country's already highly unequal income distribution (Araujo, Shirota, and Meyer 1990).

The World Bank Review (1993d) also addressed the distributional aspect of agricultural credit. It concluded that large farmers did not capture the benefits of its projects as much as predicted by the Costa Rican and Brazilian experiences for two reasons. First, the Bank projects by design often funded long-term investments of medium and large farmers compared to A.I.D. projects which were more explicitly small farmer oriented. Secondly, in projects such as in Mexico where large farmers tried to present themselves as poor in order to get cheap credit, administrative procedures were tightened by the lenders to prevent major abuses. These Bank arguments are not very convincing, however, because little evidence is presented about the actual size distribution of borrowers. It is obvious that if some groups, such as small farmers or women, are targeted as priority borrowers for subsidized loans, there will be powerful incentives for nonpriority groups to demand loans. When this demand is coupled with unscrupulous or overworked bank officials, some nonpriority borrowers will undoubtedly get loans. Furthermore, if the lenders perceive that the priority borrowers are risky, they have an incentive to tilt their portfolio towards less risky nonpriority borrowers.

The transaction costs of borrowing and lending have been analyzed to determine how they influence borrowing patterns. Since a large portion of a lender's cost in making and recovering a loan is fixed and does not vary substantially with loan size, the per unit cost of small loans is higher than large loans. Thus in the absence of interest rate controls, lenders who recover the full cost of lending need to charge higher interest rates for small loans. Donor supported programs, however, usually require that small borrowers be charged lower rates, resulting in various types of rationing by lenders to discourage small borrowers. Rationing often involves cumbersome procedures and multiple trips to the lender in order for the borrower to negotiate a loan. Empirical studies show that noninterest borrowing costs for small loans are often higher than interest charges (Meyer and Cuevas 1992). Survey data from eight countries revealed that borrowers of large loans paid transaction costs that varied from less than two percent of interest charges to almost 60 percent. Borrowers of small loans, however, paid transaction costs that varied from 13 to 245 percent of interest charges. This is one reason why small farmers choose to borrow from informal lenders with high interest rates but low transaction cost rather than seek formal loans (Ahmed 1989; Ladman 1984). Therefore, the distortions in loan allocation among small and large borrowers have their origin in both the supply and demand sides of the loan market. Liberalizing

interest rates may improve loan allocation although there are moral hazard and adverse selection problems[2] because at very high rates only the riskiest borrowers may continue to demand loans or borrowers may engage in risky enterprises (Stiglitz and Weiss 1981).

D. Impact of credit projects on lenders

Whereas the impact of traditional credit projects on farmers is ambiguous and difficult to measure, the impact on many participating lenders has become clearer and is the focus of much criticism. Many specialized agricultural development banks have failed in developing countries, and many institutions with large agricultural portfolios rely on subsidies for their survival. Several studies have analyzed the reasons for this situation. Many of the problems are attributed to the negative effects of the traditional government and donor funded agricultural credit projects.

One of the most important issues for lenders is the effect of credit projects on institutional viability. The record is quite negative. Several evaluation reports reveal poor performance of development finance institutions that have been used as important conduits for donor funds (McKean 1990). Many agricultural development banks have failed, others have had to be recapitalized because of losses, and most rely on continuous subsidies. Agricultural cooperatives and rural credit unions have a checkered record, and commercial banks frequently try to minimize their agricultural exposure. The World Bank Review (1993d) concluded that 77 percent of the institutions supported by bank agricultural projects had a good image, but only 44 percent had a good financial position by the end of the projects. In some cases, the institutions had been assisted by the Bank for several years.

The crucial variables affecting the viability of most institutions are operating costs, loan recovery rates, and the rate of inflation relative to interest rates. The impact of seemingly small problems can be devastating for a financial institution's capital. Assume, for example, that an institution recovers 95 percent of the principal and interest due on loans, that operating costs are only five percent, and the nominal interest rate on loans is below the inflation rate by only five percentage points. If the institution lends out all of its money at the beginning of the year, the real value of its' funds at the end of the year will be about 85 percent of the beginning of the year value. If all funds are lent out in all subsequent years, by the end of year five, the real value of the capital will be less that 50 percent of the original value.

Many institutions are not viable because they cannot cover loan defaults, operating costs, and inflation. Loan default is often the largest problem but data on default are scarce and unreliable. In the mid 1970s, A.I.D. (Donald 1976) and the World Bank (1975)

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[2] These problems refer to potential losses that lenders face due to the risk of choosing borrowers who are likely to default or who engage in actions after getting a loan that increase their probability of default.

struggled with incomplete and inconsistent data to present empirical information about the magnitude of the problem. In most programs studied, delinquency rates were high, frequently as much as 50 percent of amounts due. Some agencies were thought to have even higher rates that were concealed through the refinancing of unpaid debts. Many of the early studies of the causes of the problem focused on borrowers' inability to repay (Boakye-Dankwa 1979). Later studies looked more carefully at how the design of the credit projects influenced loan recovery.

The recent World Bank Review (1993d) found that out of 35 of its completed projects, 14 reported collection rates of 90 percent or more, five had rates between 50-70 percent, and nine had rates below 50 percent. Furthermore, 13 reported declining collection trends, 19 reported level trends, and only three reported improving trends. The Review was quick to point out, however, that loan delinquency is not default. For example, although collection rates varied between 50-60 percent in India, estimates of default ranged from 5 to 20 percent. The difficulty with the argument that delinquent borrowers eventually repay their loans, even if delinquency is high, is that a large amount of a lender's resources may be spent on loan recovery, and the relationship between delinquency and default may suddenly deteriorate. For example, the argument about eventual payment was made for several years in Bangladesh, but with the expansion of lending in the 1980s overdues reached huge levels. The farmers clamored for relief and the situation provided a tempting political opportunity which the government seized by using interest exemption and loan forgiveness programs to gain political advantages (Khalily and Meyer 1993). A complete breakdown in repayment discipline followed.

The reasons for recovery problems are many. As the early studies noted, borrowers experience natural calamities that make it impossible for them to repay as planned. But the more systematic problem is found in the negative impact of government and donor funded projects on recovery. First, lenders tend to be rewarded for making, not recovering, loans. This leads to lax recordkeeping about repayment schedules and weak collection efforts. Second, subsidized interest rates lead to loan rationing which provides an environment conducive to political intrusion about who gets the cheap loans, and who must repay. Third, targeted loans carry restrictions about screening criteria for borrowers which may cause lenders to make loans to customers who do not meet their normal lending criteria. A quantitative estimate of this issue was conducted by Aguilera-Alfred and Gonzalez-Vega (1993). They found that loans made from funds provided by the government or donors to the Agricultural Development Bank of the Dominican Republic had a lower probability of repayment than those made from own funds following its own lending criteria.

High operating costs damage the viability of lenders even if they recover most of their loans. The interest rate margins authorized in many credit projects are kept small in order to maintain low lending rates. But often the costs of reporting and documenting the use and impact of cheap funds provided by governments or donors is high. For example, the Agricultural Development Bank in Bangladesh developed a super form with over 150 different rows to be completed by all branches for the required documentation of lending

by crop, loan type and donor program (Meyer 1988). Cuevas and Graham (1984) measured lending transaction costs for a government-owned and a privately-owned bank in Honduras and found they far exceeded the 3-4 percent authorized with donor funds. Lending costs using donor funds were nearly five times the cost of lending using own funds for the private bank. Ahmed and Adams (1988) found that the Agricultural Bank of Sudan was limited to charging 7-9 percent on loans when its administrative costs averaged 10-15 percent. Another reason that some specialized institutions can't cover costs is that they are restricted to making agricultural loans so they cannot cross-subsidize their operations by raising the rates for nonagricultural borrowers.

A third reason for the lack of viability is that deposit mobilization has been neglected. Financial institutions that neglect savings mobilization are incomplete institutions and this affects their delinquency and default rates (Vogel 1984). When they deal with their borrowers also as savers, they obtain useful information to assist with loan screening. Furthermore, borrowers are more likely to pay and lenders are likely to exert more effort in recovery when the funds come from local savers rather than distant governments or donors. Sacay et al. (1985) noted that a "dole-out" mentality exists among borrowers in the Philippines which helps explain the low recovery rate in government sponsored lending programs. Savings mobilization can provide a more secure flow of funds to the lender than the frequent feast-famine syndrome associated with donor or government funds. This makes the lender a more secure source of funds for borrowers, and belief in the possibility of a future loan is a strong motivation to repay promptly. A.I.D. has supported several savings mobilization projects which have had a positive impact on loan recovery besides providing an important rural financial service. Important experimental projects involved credit unions and development banks in the Dominican Republic, Honduras, Peru and Bangladesh (Agency for International Development 1991).

The World Bank Handbook on Financial Sector Operations (1993d) notes that a good prudential regulatory and supervisory framework is required to preserve the stability and institutional soundness of the entire banking system . Too often in the past, Central Banks were given the task of devising and monitoring compliance of policies designed to allocate resources to priority sectors or borrowers. They were distracted from their traditional role of maintaining a sound financial system and a stable currency. The lack of appropriate regulations and weak regulatory enforcement have contributed to the failure of some institutions.

Finally, some projects have failed and participating financial institutions have collapsed because of a hostile economic environment (Chew 1987; Lieberson 1985; Meyer, Graham and Cuevas 1992; Simmons and Herlehy 1990). Some countries have experienced political disruptions, wars and civil conflicts that disrupted economic activities and created uncertainties that stymied investment and production. The general development strategy and accompanying macroeconomic policies pursued in several countries have been a major disincentive for agricultural growth (Krueger, Schiff and Valdes 1988). The terms of trade have turned against producers of major traded commodities in recent years. Some of the

new technology on which credit projects were predicated was neither as available nor as profitable as assumed.

Financial institutions are affected in several ways when policies and market trends are negative for agriculture. First, farmers and agribusinesses are poor customers for loans. Therefore, lenders make few loans so their per unit operating costs are high. Second, some customers otherwise able to repay their loans are forced to default. Third, the financial institutions are discouraged from developing financial innovations to reduce the cost of serving a dispersed and expensive agricultural clientele. Fourth, the level of rural savings available for voluntary deposit mobilization is reduced.

The lesson to be learned from the literature is that many credit projects have had a negative impact on financial institutions. In spite of large scale projects, many institutions supported by the Word Bank have made limited progress toward improved credit management, especially the management of defaults, and the financial viability of many institutions is questionable (World Bank 1993d). The Review argues that the implications of these results are not clear, however, because subsidized systems exist elsewhere, including the Farmers Home Administration in the U.S. This argument raises two important questions. The first is whether or not financial institutions have reached a point where their future sustainability can be assured through government subsidies. The second is whether or not the subsidies spent on agricultural credit projects have earned a rate of return comparable to other investments. The answer increasingly appears to be "no" because the donors have shifted from large subsidized agricultural credit projects to supporting structural adjustment loans designed to correct policy distortions and small NGOs that are experimenting with alternative delivery systems emphasizing credit for microenterprises and women. The guidelines given for designing financial sector activities (see Chew 1987, Lieberson 1985 and A.I.D. 1988 for A.I.D., and the Handbook on Financial Sector Operations 1993c for the World Bank) emphasize that projects should not only provide credit needed for the real sectors of the economy, but simultaneously serve as a catalyst for development of the financial sector.

E. Impact of credit projects on national economies

There is very little evidence on which to assess the overall impact of credit projects on the national economies of the developing countries. The World Bank Review (1993d) recognized that agricultural credit projects have been a fairly easy mechanism for the Bank to disburse foreign exchange to borrower countries. Therefore, from the Bank's perspective it was important to discover that 96 percent of all Bank funds approved for on-lending in the 41 projects studied were actually disbursed. It might be argued that the positive impact on developing countries of receiving much needed foreign exchange might outweigh some of the negative sector-specific effects discussed above. This ignores the question, however, of whether or not the large investments and related subsidies for agricultural credit projects were the most profitable investments for these economies at the time they were undertaken. Both donor and government resources have an opportunity cost and the analysis available

suggests that the long-term benefits of these credit projects have been questionable. The abandonment by most donors of the traditional credit project suggests that a large amount of skepticism exists about whether or not their overall benefits exceed their costs.

Only one detailed cost-benefit analysis has been located for a developing country of the type done in the U.S. (Hughes, Bednarz, Osborn, and Hall 1988). This study was conducted by Binswanger and Khandker (1992) using district level data for India for the period 1972/73 to 1980/81. The extra agricultural income attributed to agricultural credit was estimated to exceed government costs by only about 13 percent. Under less favorable assumptions, the benefits could even fall below the costs. Furthermore, the study did not try to assess the impact on future operations of the credit system that experienced steadily rising loan default. The difficulty with this study is that the positive impact of credit on production may have been masked by a decline in area cropped if, for example, some poor land went out of intensive cropping at the same time that credit facilitated more intensive cropping on the remaining land.

A comprehensive cost benefit study of the macroeconomic effects of credit projects will always be difficult to conduct because the fungibility of credit makes it difficult to quantify the real benefits of loans received by borrower households. Funds diverted from production to consumption expenditures, for example, may have a large, but difficult to measure, social benefit for poor households because of improvements in nutrition, education or health which may have a large economic payoff for society. On the other hand, credit projects that have led to political intrusion into financial institutions and the acceptance of high levels of loan default may represent a large social cost because of the negative long-term effects of destroying the integrity of financial institutions and the sanctity of loan contracts. It would also be difficult to quantify the negative impact on the many households that are barred from borrowing today because of their failure to pay past loans that were granted as political favors.

A study that needs to be done to clarify a controversy in Brazil concerns the impact on farm land prices of the large amount of subsidized credit received by large farmers. It has been suggested that the diversion of large amounts of operating loans to finance speculative land purchases contributed to an increase in land prices above what could be justified by its present earning capacity. This could have exacerbated the already unequal distribution of land in the country.

F. Analysis of successful cases

Although the results of many credit projects have been disappointing, there are a number of successful cases of financial activities in developing countries. It is instructive to note the nature of their accomplishments and identify the reasons for their success.

Von Pischke and Rouse (1983) identified six cases of fairly successful financial services being provided to African smallholders up to 1980. They included the Caisse

Nationale de Credit Agricole in Morocco, the Cooperative Savings Scheme in Kenya, credit unions in Cameroon, savings clubs in Zimbabwe, group credit in Malawi, and rotating savings and credit associations in several countries. Some of the factors for their success were reported to be generally favorable economic conditions, emphasis on simple traditional rural institutions and savings mobilization, and a scale of operations consistent with the routine transactions of rural people.

The Grameen Bank is world famous for successfully making thousands of small loans to poor people, mostly women, in Bangladesh (Hossain 1988). A less known story concerns several institutions in Indonesia that in total are serving even more poor people than the Grameen Bank. Chaves and Gonzalez-Vega (1993) argued that their success is due to both a hospitable environment for financial intermediation and effective organizational design reflecting an underlying concern for institutional viability. An important distinction between the two country experiences is that loans are made to individuals in Indonesia while the Grameen Bank uses groups for most lending.

The Indonesian experience in transforming failing financial institutions is also instructive. Pàtten and Rosengard (1991) analyzed the transformation of the Badan Kredit Kecamatan (BKK) and the unit desas (village units) of the Bank Rakyat Indonesia (BRI). The BKK program was set up in the early 1970s to provide loans from outside capital to rural people deemed too poor to save. By 1989 it had more than 500,000 loans outstanding, was covering all costs, including losses, and was financially viable. The unit desas were set up in the early 1970s to do in Indonesia what Masagana 99 intended to do in the Philippines to speed the adoption of Green Revolution technology. As occurred in the Philippines, the program experienced mounting arrears and operating deficits. The credit operations were redesigned in 1983-84. By mid 1990, the unit desas had more than 1.8 million loans outstanding, had more than 7 million savings accounts so savings exceeded loans, and the unit desas were consistently profitable. These two successes are attributed to a clear objective of creating viable institutions, and careful attention to institutional design, with constant monitoring of performance.

Yaron (1992c) analyzed these two Indonesian institutions plus the Bank for Agriculture and Agricultural Cooperatives (BAAC) in Thailand and the Grameen Bank because they are recognized as being four of the most successful financial institutions in developing countries. He calculated a Subsidy Dependence Index (SDI) to determine the increase in average on-lending rate required for the institution to maintain operations without any subsidy. The results based on the institutions' operations in the late 1980s showed that the unit desas had reached subsidy independence, the BKK and BAAC had a moderate SDI of 20-30 percent and were improving. The Grameen Bank was also improving but had a SDI of 130-180 percent.

A.I.D.'s savings mobilization projects in the 1980s in Honduras and the Dominican Republic were clear success stories in designing incentives to stimulate financial savings (Agency for International Development 1991). These experimental projects were imple-

mented through an Ohio State University cooperative agreement. Prior to the projects, credit unions and agricultural development banks were floundering in the two countries. They faced a shortage of funds, interest rates were not adjusted for inflation and loan delinquency and default rates were high. Through policy dialogue, the projects succeeded in changing attitudes towards interest rates resulting in positive rates of return for savers. Branches were opened in rural areas to reduce saver transaction costs. The dual stimulus of improved interest rates and reduced transaction costs prompted a large increase in deposits so the institutions were able to resume lending. Loan recovery improved because borrowers were willing to repay loans when they discovered that with improved liquidity the institutions were making new loans.

Several East Asian countries are cited as cases where subsidized interest rates, directed credit and other financial market interventions were more successful in stimulating growth and modernization than has occurred in most other developing countries (Adams 1987 and 1988b). A recent World Bank publication (1993b) provides explanations for this contrasting experience. Although the analysis does not specifically refer to agriculture, it provides important insights into the use of financial market interventions. The financial sector interventions were designed, first, to encourage financial savings and, second, to channel them into activities with high social returns. Compared to other countries, several East Asian countries achieved a better balance between the need to limit competition to assure bank solvency and maintain low banking spreads. Credit subsidies were limited in size, and stringent standards were applied to the selection and implementation of subsidized projects. Funds were usually used for the purpose intended and there were few loan losses. Where interventions did not work so successfully, as in Indonesia, the problems have been similar to other developing countries. "In contrast with Northeast Asia, credit allocation decisions in many developing countries were motivated by political and noneconomic considerations. Projects were designed with conflicting objectives ..... the very large rents that could be obtained from subsidized credit were a strong incentive to corrupt practices .....projects were prone to poor appraisal and disbursements without proper documentation ..... producing high loan losses and eventually large-scale failure of directed-credit programs." (p. 287)

Informal finance is now recognized as having succeeded where formal finance has failed to successfully operate in hostile economic environments and provide useful services to rural people. Several cases have been presented which demonstrate the positive role played by informal finance, and why it is time to reassess the negative image often held by policymakers (Adams and Fitchett 1992). Informal financial arrangements can often solve problems too difficult for formal systems. For example, in the Philippines agrarian reform beneficiaries are able to informally pawn their cultivation rights in order to secure loans for off-farm investments and emergency expenditures (Nagarajan, David and Meyer 1992). The formal system cannot accept these rights as collateral for loans.

G. Important lessons learned

The analysis of successes and failures presented above reveals a body of literature that is generally supportive of the new view of rural financial markets and the recent policies that most donors have adopted for financial projects. The failures are dominated by top-down projects designed to provide subsidized credit to targeted borrowers who are assumed to be too poor to save so savings mobilization is ignored. Often the projects intend to support food production, adoption of new technology, and reduction in rural poverty. Frequently, the objective is also to substitute for informal lenders who are believed to be exploitative. The projects are rationalized by the supposed positive impact on borrowers with relatively little concern for the impact on the participating financial institutions.

The recent theoretical literature presents divergent views about the existence of market failure in financial markets, but the authors recognize that governments (and by implication donors) have limited abilities to improve the current situation (Besley 1992; Stiglitz 1992). The many failures experienced by governments and donors are supportive of this theoretical view. Studies show that the macroeconomic, financial, and agricultural policies of many countries must be reformed before interventions in rural financial markets are likely to be successful. Improved prudential regulatory and supervisory systems are required to insure the safety and soundness of financial institutions. Interest rates must be flexible so savers can be rewarded, and financial institutions can cover operating costs and default losses. Financial viability must be a central goal and incentives provided for actions that contribute to it. Monitoring systems must measure progress toward that goal, and signal when corrective action is required. Informal finance provides valuable services to rural farm and nonfarm enterprises. It may offer opportunities for linkage with the formal system to provide greater access to financial services for small farmers and the rural poor. Careful organizational design was needed in addition to a correct policy environment for the new financial institutions that have successfully emerged in recent years. More experimentation is needed with village banks, rotating savings and credit societies, and other user-owned institutions to design viable institutions and technologies for delivering financial services in the uncertain rural environments found in many developing countries.

V. Evaluation of Agricultural Marketing Services

A. Importance of agricultural marketing services

Agricultural marketing services tend to receive less project assistance from donor organizations than many other areas of project assistance. During 1980 to 1986 the major bilateral and multilateral technical and financial assistance agencies including A.I.D., EC, IDB, IFAD, OPEC, World Bank, and others made capital commitments to agriculture amounting to $ 12.5 billion with only eight percent of that amount allocated to agricultural marketing services [Meissner 1989]. Among the agencies the percentage allocated to "marketing only" projects ranged from 0 at IFAD to 16 percent for A.I.D. [Meissner 1989].

About 12 percent of 203 A.I.D. projects funded between 1958 and 1982 focused on assistance for "marketing only", although many other projects such as credit projects frequently have had a "marketing component" [Solem, Wilcock, Lynch and Taylor 1985]. Inter-American Development Bank assistance for agricultural marketing services is also low [Meissner 1989]. World Bank project assistance in agricultural marketing is even more limited. A review of 402 agricultural projects from 1974 to 1985 discovered only 12 projects with a "marketing only" focus although 49 percent of the projects had some "marketing components" [World Bank 1990]. The amount of resources allocated to the marketing components was only three percent of total investment in the agro-industries portfolio, a small amount relative to the size of the projects.

Geographically, the World Bank marketing assistance in 185 agricultural projects from 1974 to 1985 was distributed to Eastern Africa (51), Western Africa (59), East Asia (31), South Asia (4), Europe, Middle East, North Africa (10) and Latin America and Caribbean (30). A total of 203 A.I.D. agricultural service projects including credit, input and output marketing between 1958 and 1982 was distributed to Africa (72), Asia (40), Latin America (70), and Near East (21) [Solem, Wilcock, Lynch and Taylor 1985].

B. Appropriateness of marketing services assisted by donors

Most project assistance for marketing services from donor organizations is focused appropriately on a few commodities particularly grain crop marketing, commercial crop marketing, livestock marketing, and, to a limited extent, fruit and vegetable marketing. World Bank marketing assistance in 185 agricultural production projects has been most consistently distributed to grain crops (67), commercial crops such as cotton, tobacco and tree crops (67), and livestock (51). Marketing assistance in livestock was more common in Latin America and Caribbean and East Africa, while commercial crop assistance was more important in East and South Asia. Grain crop marketing assistance was important in all regions. The distribution of A.I.D. marketing assistance by commodities is about the same as the World Bank except that fruits and vegetables have probably received more assistance from A.I.D. than in World Bank projects [Schermerhorn 1986].

A review of the types of marketing service assistance included in the World Bank project components indicates a heavy emphasis upon "marketing hardware" such as market facilities, storage facilities, post-harvest facilities, agro-industry and processing, and roads and transport. Little emphasis was placed upon assistance for "marketing software" such as research, extension, price discovery, risk bearing, financing, market information, grades and standards, contracts, and increasing market competition [World Bank 1990, p. 27]. "Marketing software" assistance can be low cost yet very important. World Bank studies have found that small merchants and farmers can perform grain storage functions very efficiently; their investment cost for comparable facilities is 50 to 100 percent of the government cost [World Bank 1990, p. 41]. Yet merchants generally have great difficulty obtaining bank credit to finance various activities including the construction of facilities and purchases of commodities. A recent study concludes that "trade finance mechanisms in

much of the developing world are rudimentary or nonexistent" [Wenner, Holtzman, and Ender 1993, p. 47].

Although the data are not available to the authors, A.I.D. appears to have more balance between assistance for "marketing hardware" and "marketing software" projects. In some countries donor coordination leads to agreements to specialize assistance in selected types of activities which may explain the way assistance is allocated among donors.

The type of marketing service selected for project assistance needs to be appropriate for the recipient country. In some instances, the equipment is too capital intensive or too technologically advanced for the country such as high cost, specialized bulk grain handling and silo storage facilities when low cost flat warehouses and bag handling are more appropriate [World Bank 1990]. Grain storage projects in India, Bangladesh, Brazil and elsewhere were justified on the grounds of significant losses in traditional storage (from 17 to 21 percent). The projects' designers argued that bulk storage of grain in large facilities was more economical and would reduce significantly postharvest losses. Recent research has found that losses in traditional storage are much lower than previously thought (1.5 to 4.5 percent) and that bagged storage is more economical and flexible [World Bank 1990, p. 4]. The re-calculated economic rates of return (ERR) for the India and Bangladesh projects decreased from an original ERR of 25 percent to an ERR of 8.5 percent using the highest justified "without project" postharvest loss estimate of 5 percent. Adjusting for actual cost overruns reduces the ERR to 7.2 and moving to more realistic postharvest loss estimates would reduce the actual ERR to a very low level [World Bank 1990, p. 41]. Given the low re-calculated ERR, it is very likely that the World Bank would not have considered the re-calculated ERR's as bankable projects.

Large investments in wholesale markets and rural markets in Latin America, Asia and other areas were also justified on the basis of improving food marketing systems through reducing food losses and marketing margins by improving the performance of the food marketing system [World Bank 1990 and Harrison, Henley, Riley, and Shaffer 1974]. Many of these donor projects financed the construction of facilities that are owned and operated by the public sector. The calculated ERRs for some of these markets were most likely over-estimated for reasons similar to those for the grain storage facilities [World Bank 1990].

The appropriateness of livestock project assistance in Africa has been especially troublesome because of a conflict between a nomadic type of production and the desire to modernize this production and to promote the use of more permanent pasture systems [Johnston, Hoben, Dijhkerman, and Jaeger 1987, p. 159]. A Kenya livestock development project found problems of animal health and disease control in the marketing of animals that needed to be herded long distances from the rangeland to the consumption points. A Tanzania livestock project lost an existing export market as a result of a political decision to nationalize export meat processing. The project found great difficulties entering new markets once the original market was lost [World Bank 1990, p. 58]. Bolivia and Brazil live-

stock development projects found that the main negative factors were government controls on the price of beef, export restrictions, and marketing and processing problems [World Bank 1990].

World Bank marketing assistance by type of institution indicates a very large share allocated to parastatals, small amounts to the private sector and to cooperatives, and none to non-government organizations. [World Bank 1990]. Although more balanced, A.I.D. marketing assistance was also oriented mainly to the public sector (52%), mixed public/private sector (26%), and some private sector (22%) [Solem, Wilcock, Lynch and Taylor 1985]. The large share of donor assistance to the public sector has failed to produce the intended efficiency gains causing donors to re-evaluate their programs and to attempt to increase the share of assistance to the private sector. However, constraints imposed by donor requirements and by host government reimbursement guarantees, such as the exchange rate risk for hard currency loans and very restrictive A.I.D. regulations, complicate direct assistance to private firms except for some technical assistance and "targeted on-lending" through agricultural banks.

C. Timeliness and accessibility of markets

Access to markets continues to be a serious problem for many farmers, especially small farmers, in most developing countries. It is argued that improving access to markets is an important way to increase the participation of farmers in the market economy and to improve their ability to sell their output and buy farm inputs and consumer goods at more favorable prices. Marketing service assistance from donor agencies has attempted to improve market exchange through projects designed to build rural roads, storage facilities, wholesale and retail markets, market information services, and cooperative marketing to correct the problem of market access.

Donor assistance, primarily to the public sector parastatals, has been successful in building a great deal of marketing "hardware" in many countries but the results have been disappointing because the facilities have frequently failed to improve market access for small farmers and the parastatals have not become financially self-sustaining. In many cases the facilities have deteriorated quickly because of poor maintenance. This has been a serious problem for public markets, and grain storage and handling facilities in Latin America and the Caribbean and Africa [World Bank 1990] Poor management of parastatals, wrong type of facility or wrong location of facilities, and high cost have added to these problems. Farmers complain about lack of access, slow service, payment delays, and low prices from many of these parastatal companies. For these reasons, many farmers prefer to use the private sector informal parallel markets. A World Bank evaluation of marketing projects with public sector and cooperative marketing components found the following problems in evaluation documents:

- inefficient and inexperienced management;
- inadequate record keeping and stock controls;

- late arrival of purchasing teams in the production area;
- insufficient cash resources to purchase the product, and late and incorrect payments to producers for their products;
- poor financial controls, inadequate accounting and auditing, and financial irregularities;
- inadequate transport resources and logistic management;
- over-staffing and high costs of operations; and
- the unfavorable impact of government pricing policies on operating margins; and
- the difficulty of providing adequate rewards and penalties to management for its performance [World Bank 1990, pp. 34-35].

The cotton parastatals in Francophone African countries appear to be an exception to the general problems of most parastatals. The "Compagnie Francaise pour le Developpement des Fibres Textiles" (CFDT) has been the model developed in Senegal, Cameroon, Mali, Burkina Faso, and Ivory Coast. The CFDT model is a vertically integrated system that has a high degree of coordination among all the actors in the cotton production and marketing system. The approach combines development and extension of technology, input supply, marketing, processing and financing. The CFDT model is credited for much of the success of the high input/high yield cotton production technology in Francophone countries compared to the low input/low yield technology of Anglophone countries [Lele, Van de Walle, and Gbetibouo 1989.]

A.I.D. and other donors have assisted the development of market information services in many countries. Daily, weekly and monthly price information services for basic foods at the retail, wholesale and farm level and quantities marketed have been initiated and continue to operate in countries such as Brazil, Chad, Colombia, Costa Rica, Ecuador, Indonesia, Kenya, Korea, Mali, Philippines, Taiwan, Tunisia, and Thailand. Some of these services are being established through A.I.D. projects with Michigan State University and the Agricultural Marketing Improvement Strategies Project (AMIS).

These services have helped to improve market arbitrage through better information about when and where to market products but there is room for improvement [Holtzman, Ouedragogo, Wittenberg, Menegay, and Aldridge 1993]. These authors conclude that some of the services need to improve the accuracy and timeliness of the information. Most of the services need a stronger orientation to the prospective users of the information such as private sector users and policymakers. Designing a workable system for these two different users is not easy. A very important, but missing component from most of the market information services, is outlook information about anticipated supply and demand and current stocks that would serve the private and public sector well as an early warning system for imports and/or exports.

D. Profitability and return of market services

Creation of profitable markets-- where the participants have the incentive to invest, to assume risk and to expect a satisfactory return on that investment-- is probably the single most important consideration in project success or failure. Research has found that producers are rational and will respond to economic incentives, and that producer prices in developing countries are typically below the prices in developed countries [Peterson 1988]. Based on the estimated long run supply elasticities (in the range of 0.90 to 1.19), higher prices will increase production substantially. Unfortunately, governments frequently intervene in markets with policies that depress producer prices and have a adverse effect on food production [Krueger, Schiff, and Valdes 1988].

Price level and price stability are central to the issues of incentives and profitability of markets. Governments may use a variety of policies to intervene in markets to affect prices in ways desired by policy makers. These policies include over or undervalued exchange rates, price ceilings, pan-territorial or uniform pricing, pan-seasonal pricing, marketing margin controls, high import and export taxes, parastatal marketing monopolies, and high sales taxes. These policies can reduce producer price levels dramatically to the point of eliminating incentives and profits to produce (Figure 1 illustrates the production impact of price reductions). For example, a large number of African and Central and South American countries (Ghana, Niger, Mozambique, Tanzania, Argentina, Brazil, Dominican Republic, Guyana, and Ecuador,) have used over-valued exchange rates in combination with other polices to depress producer prices in an attempt to control inflation and reduce food costs in urban areas [World Bank 1990, World Bank 1991, and Wolgin 1990]. As a result of lower producer prices and profitability, agricultural production and exports stagnated. In contrast, governments in some Asian countries such as Hong Kong, Korea, Malaysia, Singapore, Taiwan, and Thailand have used a stable macro-economic environment with lower inflation, more appropriate exchange rates and more competitive markets to promote agricultural production and exports with more favorable prices [World Bank 1990 and 1991].

Price instability caused by thin or poorly performing markets, rainfall variability, or disease and pests can also reduce and/or eliminate the incentives to produce. Price instability is a problem for grains and other storable products as well as for the highly perishable products such as fruits and vegetables [Idris, Larson, and Baldwin 1990]. Price instability is most serious in these markets because small variations in supply can cause large price swings due to the inability of the market to absorb the increased production. Many projects attempting to diversify small farmer income through the introduction of new crops and livestock products have failed because of the lack of a stable market (domestic and export) for the new output. A World Bank review of export marketing of fresh produce from the Middle East to the EC found that projects need to pay close attention to the foreign and domestic market for farm products [World Bank 1990, p. 44]

Governments frequently intervene in markets to stabilize prices through minimum price purchase and storage operations for grains. The costs of these purchase, storage and

sale operations have usually been very high causing large deficits that had to be paid by the government. Most of these operations have been conducted through government owned parastatal marketing boards. A review of the performance of these minimum price and storage operations in terms of the costs and benefits of stabilization indicates that the operations need to be dramatically downsized in most countries. Increased reliance upon trade to stabilize grain prices is more cost effective than government purchase and storage operations for many countries [Abbott 1985 and Neils, Reed and Lea 1992].

E. Issues of public or private sector delivery of services

Until very recently, donors have preferred to work with public sector organizations for the delivery of marketing services in developing counties. The performance of these organizations has been very disappointing to the users, the government and the donors [World Bank 1990 and 1991]. Donors prefer and sometimes are constrained to work with government organizations for a variety of reasons such as the belief that government could solve the problem, because of the convenience of working with existing organizations in most cases, and the security of government guarantees on loans. High costs, poor management, misuse of funds, political pressures to intervene, poor service and large operating deficits are some of the problems that have appeared in most of the projects assisting public sector organizations in marketing. Reducing government intervention in markets is viewed as necessary to improve market performance [Krueger 1978 and World Bank 1991].

Because of government failure, a shift in emphasis to deregulation of markets and promoting increased private sector participation has been occurring at a rapid rate in most developing countries since the mid-1980s [World Bank 1990 and 1991; Wolgin 1990, and Simons and Kent 1993]. Many countries are attempting to promote competition by opening up the economy to private firms, and by privatizing government parastatals and/or the functions of existing marketing organizations. Important structural changes are taking place in the states of the former Soviet Union, Eastern Europe, Chile, Brazil, Mexico, Tanzania, Mozambique, Niger, Bangladesh and others [World Bank 1990 and 1991].

Wolgin [1990] analyzes the experience of A.I.D. in agricultural market liberalization in Africa. He examines the Mali Cereals Marketing Restructuring Program, the Gambia Rice Market Privatization Program, the Madagascar Food for Progress Rice Liberalization Program, the Zambia Multi-channel Agricultural Marketing Program, the Togo Cereals Export Liberalization Program, the Uganda Non-Traditional Export Promotion Program, the Mozambique Private Sector Rehabilitation Program, and the Niger Agricultural Sector Development Grant. His main conclusions are:

- The biggest impact from market liberalization is the reduction in marketing costs that results in an increase in incomes of both producers and consumers;

- In most liberalization experiences, real consumer prices have fallen;

- Most government monopolies were honored in the breach, and illegal parallel markets existed in most areas (Zambia is an exception) prior to liberalization. Nevertheless, the illegality of these markets substantially increased transaction costs and marketing margins;

- Despite decades of suppression, despite poverty, despite sparse populations, despite war, there exists a broad trading community ready to enter into the input and commodity markets in most countries; and

- Most liberalized markets are competitive, with marketing margins reflecting real costs of transportation and assembly; none of these cases demonstrate the existence of a rapacious, oligopolistic private trading system [Wolgin 1990, p. 34].

Lele and Christiansen [1989] conclude that the experience with public sector intervention in agricultural marketing in the MADIA countries (Kenya, Malawi, Tanzania, Cameroon, Senegal, and Nigeria) indicates a clear need for institutional pluralism in fostering competition. The private sector can provide increased competition and can perform some tasks more efficiently than parastatals, but if the private sector is to operate efficiently, the public sector must provide some basic services. These services include:

- stimulating the development of an entrepreneurial class capable of undertaking risk; encouraging free entry into markets;
- creating adequate infrastructure, transport, and communication networks for the efficient movement of goods, and;
- promoting efficient financial markets that are able to support commodity markets. [Lele and Christiansen 1989].

A similar review of the components relating to marketing institutions in World Bank projects suggests several shortcomings:

- inadequate marketing margins (due to price controls) were the primary cause of poor service from both public and private marketing channels;
- problems of poor management in large parastatals and cooperatives seemed to outweigh the potential benefits of economies of scale;
- cooperatives have often proved ineffective in marketing even though they had a more commercial orientation than parastatals;
- where parastatals existed, private sector market channels continued to provide services and were often preferred by farmers; and
- even successful parastatals tended to have difficulty maintaining good management and effective services [World Bank 1990, p. 3]

F. Analysis of successful cases

Policy and regulatory reform of agricultural marketing services includes restructuring of the institutions providing the services, reform of agricultural exchange rates and price policies, reducing or eliminating subsidies, reducing the role of public sector marketing, and encouraging private sector activity. Several of these policy reforms are being implemented successfully in the cases illustrated here and in other developing countries. Some examples follow:

"In Tanzania, various marketing reforms have been implemented since 1984, including the reintroduction of cooperatives, the abolition of crop purchasing authorities (1984), a more tolerant attitude toward private traders (e.g. the elimination of restrictions on buying and transporting grains), a more clearly defined and restricted role for the grain-marketing parastatal (NMC), and legalization of private sector purchases from and sales to the NMC, cooperative unions, primary societies, and farmers. A preliminary assessment shows that all these steps have had a very positive effect-as could be expected in a country that had been operating substantially below its production possibility" [Lele and Christiansen 1989, p. 22].

"In Nigeria, marketing reforms have concentrated on privatization of export crop marketing, since food crop marketing is already largely in the hands of the private sector. Export crop marketing was a government monopoly until the end of 1986, when the relevant commodity boards were abolished as part of the structural adjustment program. Subsequent privatization of export crop trading, combined with currency de-valuation in October 1986, led to substantially higher producer prices for these crops. However, privatization also led to problems of quality control, as a result of which Nigerian cocoa now sells at a discount" [Lele and Christiansen 1989, p. 23].

"Ghana is expanding the fresh export market just as that market is growing rapidly. The prospects are good. The European market is relatively close and the land resources good. What is lacking is the structuring of a complete vertically coordinated system. That would involve coordinated planting and cultivation for quality and timing control, the development of secondary (processing and local) markets and appropriate handling systems. In short a duplication of the U.S. vegetable processing system is needed. Preceding all of this, a careful marketing study in Europe is required. Structuring such a system in Ghana using market incentives contracts, etc.) will be a lengthy process" [Lesser 1992, p 3-6].

"Ecuador has successfully pursued policy and regulatory reform of agricultural marketing services in the 1980s to deal with a stagnating economy and agricultural export sector. The exchange rate reform of the 1980s illustrates a change from an inward-oriented development policy based on import substitution to an export oriented and market oriented development policy. In May of 1982, free market rates for the

"sucre" were more than 50 percent above official and intervention rates. Policy-makers embarked on exchange rate reform that included a 33 percent de-valuation of the "sucre" in mid-182 mini-devaluations from 1982 to 1984, another major devaluation in 1985 and a shift to floating rates in 1986, a return to fixed rates in 1988 and a managed float after August, 1988" [Bejarano, Lee and Greene 1993 p 2].

Marketing reforms have focused on the three parastatal monopolies and 25 mixed government/private marketing companies in Ecuador. ENAC is a price stabilization body for major grains and cotton, EMPROVIT is a state enterprise that sells basic foods at official prices to consumers. E.N. SEMILLAS is the national seed company. Like most parastatals, these have many problems of high cost, poor service, operating deficits etc. The government of Ecuador in the last few years has reduced the role of these parastatals by privatizing many of their functions and attempting to sell off the facilities. Agricultural production, exports, and marketing of the private sector have responded positively to the policy and structural changes [Abbott 1985].

"A loud and clear message in the marketing and policy literature of the past five years is that donor agencies must understand the medium to long-term nature of institutional reform. The Cereals Sector Reform Program (PRMC) in Mali illustrates the benefits of staying the course; donors have collaborated for a decade in restructuring the cereals board OPAM, changing it from a statutory monopsony to a food security agency which maintains a strategic reserve and provides market information services to both the public and private sectors, financing empirical studies to monitor the impacts of cereal market liberalization and inform policy formulation, and providing financial assistance to the emerging wholesale trade in cereals through implementation of a targeted credit program. by 1988-89 OPAM was out of the business of trying to support a producers floor price, which had been set too high....A vibrant private grain trade has emerged, which has exported modest quantities in surplus years.... Studies of grain producers and marketing agents provided a strong empirical base on which to design a Market Information System (MIS) in OPAM by 1988-89, which has been widely regarded as the most successful MIS design and implementation efforts funded by A.I.D. in Africa. The long term payoff from patient, analytically driven cereals policy and institutional reform needs to be heeded." [Holtzman et al. 1992, p. 18].

An assessment of grain storage in Ukraine and Russia was completed to improve the storage of grains in the New Independent States (NIS), giving emphasis to the emerging private sector and the need for low cost storage in the agricultural producing regions. Borsdorf et. al. [1992] found that, as in many other countries, the reported post-harvest losses of up to 40 percent were impossible to document. Physical losses are considered to be much lower; however, improvements in grain storage, drying, handling and conditioning are needed but the institutional barriers are large [Borsdorf et. al. 1992]. The study also found that individual private farmers have no storage facilities and must either sell grain at harvest or rent storage in the state elevator system or at state/collective farms. The public

sector has sufficient capacity under its control, but the capacity is sub-standard. In Russia one of the most significant factors affecting grain storage is the conflict between the state and the farmers concerning the price the state is willing to pay farmers for wheat required to be delivered under state order. The study concludes that the state monopoly on storage and purchasing must be broken if privatization and competitive markets are to succeed.

The success of nontraditional exports from some countries is an excellent example of what can be done through changing the marketing system. Nontraditional exports or high value foods (HVF) usually include products such as fresh and processed fruits and vegetables, meats, fish, dairy products and vegetable oils. Changing consumer demand in the importing countries has been the engine driving the growth of these developing country exports. During the 1980s, the value of traditional exports such as cereals, sugar, and tropical beverage crops actually declined while the value of trade in HVF increased 4 percent annually for items such as fresh vegetables and fresh meat to over 11 percent annually for dairy products and shell fish. Exports of HVF by middle and low income countries totaled $52.5 billion in 1990 compared to traditional exports of only $26.3 billion for coffee, cocoa, tea, sugar, cotton, and tobacco [Jaffee 1993].

There have been some failures in export promotion but also some notable successes. The successes are examined in a World Bank study of 15 commodity system success stories from 9 countries [Jaffee 1993]. The 15 cases are: (1) Mexican fresh tomatoes, (2) Kenyan specialty and 'off-season' vegetables, (3) Israeli fresh citrus, (4 to 6) Chilean temperate fruit, processed tomatoes, and fish products, (7-8) Brazilian frozen concentrated orange juice and soybean products, (9-10) Argentine beef and soybean products, (11-13) Thai poultry, tuna, and shrimp, (14) Chinese shrimp, and (15) Taiwanese high-value processed foods.

These successes exhibit several lessons valuable for donor agricultural marketing technical assistance projects. Each commodity system faced very favorable international market conditions during the 'take-off' stage and for many subsequent years. Most of the commodity systems faced favorable macroeconomic policies at the time of their initial "take-off." Several common ingredients needed for the competitive response to a favorable market were: (a) favorable natural endowments, (b) strong human capital, (c) well-developed physical infrastructure, and (d) the capacity to effectively develop and/or adapt imported production and processing technology. Another common factor was the prior or parallel development of complementary industries which lowered input or investment costs or created additional demand. In nearly all cases, the private sector has played a dominant, if not exclusive role in commercial production, processing, and trading activities. In the vast majority of cases, governments have provided facilities and services which have either public good properties, give rise to externalities, or exhibit large economies of scale. Developing countries can compete against industrialized country suppliers in markets for a wide range of high value products. Export diversification often depends upon prior or parallel domestic market development. The study concluded that government interventions should be generally geared toward encouraging competitive and flexible export marketing structures and not

provide favorable treatment to some (e.g. monopolies) and exclude others [Jaffee 1993, pp 57-60].

VI. Evaluation of Agricultural Input Marketing Services

A. Importance of agricultural input marketing services

Another report of this "investments in agriculture" review will focus specifically on issues of agricultural technology development and diffusion. For the purposes of the present report, agricultural input marketing services includes the marketing systems or delivery systems that are needed for biological, chemical and mechanical technologies. Farmers require efficient input marketing services that can deliver the right product, at the right time, in the right amounts, at a convenient place, and for a reasonable price.

The impact of price policies and input marketing services on the diffusion of improved technology should not be underestimated. In a study of agricultural technology in Sub-Saharan Africa, Oemke and Crawford (1993, p. 10) found that ..."input supplies including seed and credit) and output markets play key roles in supporting or restraining adoption of productivity increasing agricultural technology. Lack of effective, improved seed multiplication and distribution was a critical constraint in Uganda and Niger, as was lack of fertilizer in Zambia. In contrast, wide use of improved maize hybrids in Zambia was encouraged by relatively effective input and output markets."

Agricultural inputs and the associated marketing services have received a great deal of attention from developing countries and donor organizations in an effort to improve land and labor productivity and incomes in rural areas. Frequently, the agricultural input marketing services have been developed to deliver a package of inputs that farmers buy to obtain the expected gains in productivity. Credit to finance farmer purchases was often an essential part of this input package. Many credit projects discussed above had major agricultural input marketing components.

In most donor projects the biological technology has focused on efforts to improve crop productivity (especially better seeds) more often than livestock productivity; the chemical technology has focused efforts largely on fertilizer projects; and mechanical technologies focused efforts on small scale mechanization. Animal traction has not received much donor attention and is not included in the present report.

The main institutional models employed for input marketing services include private retailers, agricultural banks, cooperatives, government institutions such as parastatals, and non-government organizations (NGOs). A World Bank survey of input marketing in the 1980s in 39 countries examined the frequency of government and private sector control (control was defined as 80 percent or more of the activity) and showed the very strong tendency for government control of procurement and distribution [World Bank in Abbott 1993]. The

countries reported 64 percent government control for fertilizer supply, 61 percent control for seed supply, 47 percent for chemical supply and 42 percent for farm equipment supply. Private sector control was only 11 percent, 11 percent, 17 percent and 22 percent, respectively. The remainder was mixed government and private sector involvement.

B. Appropriateness of agricultural input marketing services

The appropriateness of agricultural input marketing services is best illustrated in crop technology development and distribution. Widespread gains in food crop productivity have occurred from the improved rice varieties, especially irrigated rice, wheat and maize varieties in many countries of Africa, Asia and South America. Widespread productivity gains comparable to these three examples have not been achieved for other crop products or for livestock products.

A major difficulty with developing the appropriate of technology is the weak research base in most developing countries. Very few countries have the human resources and institutional resources to conduct scholarly research for an extended period of time to discover the technologies that work. Developing countries have had to depend upon technology developed by the international research centers (CIAT, IRRI, ICRISAT, CIMMYT etc.) for local application or on technology developed for more advanced countries that can be adapted to local conditions [Oemke and Crawford 1993].

Of the chemical technologies, fertilizer manufacture, import and distribution have been common to a large number of donor projects. They often have involved the use of parastatals. The fertilizer technology has proved to be appropriate at the farm level when other components of the input package were also appropriate such as for irrigated rice and high value export crops. Fertilizer applied to traditional crops has generally not been profitable in spite of many project efforts and huge government price subsidies to encourage fertilizer applications [Lele, Christiansen and Kadiresan 1989].

A.I.D. has supported a number of fertilizer market liberalization programs in Asia, Africa, and Central and South America designed to reduce government fertilizer subsidies, reduce or eliminate fertilizer price and marketing margin controls, reduce government parastatal distribution of fertilizer and increase private sector marketing of fertilizer and other inputs. Wolgin (1990) recently examined the Malawi Fertilizer Subsidy Removal Program, the Kenya Fertilizer Marketing Development Program, the Cameroon Fertilizer Sub-Sector Reform Program, and the Guinea Economic Policy Reform Program. From this examination he concludes that:

- Private marketing is substantially more efficient than public sector marketing, and the efficiency gains of privatization can amount to 25 % of the total cost;

- The available evidence suggests that private markets are competitive and efficient;

- Privatization is extremely complicated and difficult; and

- Not all donors have bought into the A.I.D. view of [reducing] fertilizer subsidies and marketing, and some donor programs actually work at cross purposes to what A.I.D. has been trying to achieve. This makes the task of donor coordination much more important and more difficult [Wolgin 1990, p. 37]

Mechanical technology has generally not been the focus of donor projects in developing countries. The large scale of developed country machinery has prohibited the widespread transfer of this technology to the developing world. Small tractors, sprayers, pumps, plows, carts etc. have been found to be appropriate in a number of country projects such as Bangladesh, India, Thailand, Korea, and Mali.

C. Timeliness of delivery of agricultural input marketing services

If appropriate technology is developed and available within the country, the technology may fail due to the lack of timely delivery to the farmer. In modern, input intensive, biological production processes, timely availability of inputs is essential. In traditional, subsistence agriculture, timeliness of input delivery is not important because few inputs are purchased off the farm. As farms modernize and adopt the technology packages, they become very dependent upon timely input delivery services. A large number of factors can affect the timeliness of deliveries. Credit is important to finance the purchase of these input packages for farmers and for merchants. The inefficiencies of the banking system can cause credit delays so the farmer cannot buy the input when needed. Merchants can and do finance some fertilizer sales to farmers, but their ability to obtain bank financing greatly reduces the amount of informal finance. Bad weather, poor roads and ineffective transportation systems can delay the delivery of inputs. Inefficiencies of government owned parastatals that have monopoly control of the distribution of inputs and shortages of foreign exchange cause delays or shortages of inputs.

A study of fertilizer policy in Africa identified the following supply constraints associated with the timely delivery of fertilizers: macroeconomic factors such as shortages of foreign exchange to import fertilizer, budgetary problems of parastatals to finance imports and distribution, import licensing systems, lack of working capital for importers, wholesalers, transporters, and retailers, price controls and fixed marketing margins, poor transport facilities, remote production areas, and a weak cooperative sector [Lele, Christiansen, and Kadiresan 1989, p.47].

D. Profitability of agricultural input marketing services

The importance of profitability of input use should not be underestimated. The market system depends upon returns (profitability) to determine the allocation of resources. For example, a farm level benefit cost ratio of two or more is considered necessary for the widespread adoption of fertilizer. The profitability must be at least that high to assume the

increased risk associated with fertilizer use [Lele, Christiansen and Kadiresan 1989]. This profitability level has been obtained for the Green Revolution varieties but not for many traditional crops. The profitability of using improved varieties or hybrid seeds is a similar problem for input marketing. "It has been demonstrated many times during the past 25 years that truly superior seeds will almost 'sell' themselves. Marketing difficulties, however, are encountered when the seed represents a solid, demonstrable, but only modest improvement over the seed presently planted by cultivators (e.g. yield advantage of less than 20%)" [Pray and Ramaswami in Abbott 1993, p. 312.]. Although no empirical estimates are available, demand is likely to be very inelastic for the truly superior seed and very elastic for the not superior seed. Because of the large potential demand for increased use at a lower price governments frequently sell inputs at low and controlled prices or choose to subsidize the sale of these inputs. Both approaches have many implications for market intervention, government costs, input costs and equity to users, and private sector participation.

Government intervention in markets through over-valued exchange rates, subsidies, interest rate, and output and input price controls frequently influence adversely the profitability of input use in agriculture. This intervention and reduced profitability was considered to be a major problem in the El Salvador agricultural inputs industry [Hugo, Worman, and Ramos 1992]. If the appropriate technology exists and the input marketing system is effective, input use may fail because of government policies that eliminate the profitability of use. Government desires for cheap food for urban consumers and the widely held view that profits are "bad" are used to justify intervention in markets to reduce producer prices for output [Jebuni and Seini 1992]. Policy makers may choose to subsidize input use or attempt to control input prices at low levels as a way to compensate producers for these reduced output prices.

E. Analysis of successful cases

Bangladesh illustrates successful structural and policy reform in input markets. Government of Bangladesh (GOB) policy has emphasized growth of competitive markets and increased private sector participation in marketing and distribution of fertilizer, irrigation equipment, fuel, improved seeds and pesticides since 1978 [Larson 1992]. One result of this policy has been that Bangladesh has changed completely the fertilizer marketing system by eliminating the government owned parastatal monopoly control of pricing and distribution. Until 1978, the Bangladesh Agricultural Development Corporation (BADC) controlled all aspects of the importation of fertilizers, purchase of fertilizers locally from the domestic manufacturer Bangladesh Chemical Industries Corporation (BCIC), transportation, storage, financing, wholesale and retail sales and pricing. Many problems of pricing, subsidies, financing, inefficiencies of distribution and warehousing, high costs, shortages of supplies, and complaints of poor service emerged during the BADC era [IFDC 1990 and 1991].

With A.I.D. assistance in 1978, the International Fertilizer Development Center (IFDC) on contract through the Fertilizer Distribution Improvement Project (FDIP-I) began

work with the GOB to reform the fertilizer sector and to increase private sector participation in the fertilizer market. Major accomplishments as of mid-1980 include the following:

- BADC's fertilizer points of sale will be reduced by 55-60%; about one-third of the original 130 thana warehouses have been closed.
- In the Chittagong Division, farmer access to fertilizer points of sale has greatly increased.
- Prices paid by farmers for fertilizer under the NMS (New Marketing System) are lower than under OMS (Old Marketing System).
- A new class of private wholesalers developed as intermediaries.
- Despite the change in the system and a local drought, fertilizer sales in the Chittagong Division, as a percentage of national sales remained unchanged. [World Bank in Abbott 1993, p. 303].

More change has occurred since the mid-1980s. Private sector market share in total national sales of all fertilizers increased to over 84 percent in 1990-91 from 61 percent in 1989-90 and from nearly zero when the program began [IFDC 1990 and 1991]. Private firms now handle all urea marketing and since March of 1989 have been allowed to buy urea directly from factories for the same price as BADC. At the same time, private firms were allowed to take delivery of imported fertilizer directly from ships at the ports. In a major policy reform, the GOB allowed private sector imports of fertilizer (previously BADC controlled all imports) for the first time in June of 1991.

Fertilizer retail and wholesale price controls have been eliminated, but the GOB retains control of the domestic price of imported materials that are currently subsidized by setting the domestic price about 23 percent below the cif cost or import parity price. This subsidy applies to triple super phosphate and muriate of potash which are the main imported materials.

Private sector merchants of irrigation and agricultural equipment have become increasingly important in the economy since the GOB reforms to encourage privatization in 1978. BADC which used to be the sole collector and distributor of all domestic and foreign fertilizers, pesticides, irrigation and agricultural equipment has given up control of these agricultural inputs to the private sector. Private sector shares have increased from less than 10 percent of sales to about 90 percent while the government owned BADC share has decreased from over 90 percent to about 10 percent of irrigation and agricultural equipment sales in the 1980s. Since the elimination of BADC standardization of imported equipment, farmers may choose from a wide range of engine types and sizes [Larson 1992].

Ghana is an example of structural reform in progress with some positive benefits already observed. In Ghana, modern agricultural inputs (fertilizer, agrochemicals, seeds and machinery have been heavily subsidized to increase agricultural productivity and production and to compensate for low producer prices [Jebuni and Seini 1992]. Parastatal companies

were organized to monopolize the importing, distribution, and sale of the subsidized modern inputs. In 1983, the government of Ghana initiated the Economic Recovery Program to restore economic growth. The program included macroeconomic stabilization and structural adjustment. The key policy changes included several devaluations of the exchange rate to more realistic levels, price and income policy to restore producer price incentives, tight fiscal and monetary policy, removal of subsidies on modern agricultural inputs, and privatization of the import, distribution and sale of inputs.

Agrochemicals are now largely handled by the private sector. Subsidies have been eliminated and prices have been uncontrolled for some time. Several major companies import and distribute chemicals; however, availability is restricted to dealers in large towns because effective demand is small. The Ghana Seed Company, a candidate for privatization, has not operated since 1989 creating a vacuum in the seed industry. Reliance has been placed on the Grains Development Board, and a few selected private seed growers to fill the void. A national seed service has been established to supervise the seed industry. Private seed growers have been registered in all major ecological zones and will be assisted to produce and market certified seeds to farmers throughout the country. The Ministry of Agriculture machinery services to farmers have been eliminated. The tractors and combines have been sold to private farmers. Nominal charges for tractor services have increased because of the elimination of subsidies. In real terms farmers have benefitted because they now pay 70 percent less for plowing than in 1980 and 30 percent less for carting [Jebuni and Seini 1992].

Cameroon has initiated a Fertilizer Subsector Reform Program (FSSRP) with assistance from A.I.D. designed for implementation from 1988 to 1992 [Blaine et. al. 1991]. The FSSRP emphasizes economic liberalization and privatization of the fertilizer sector. This includes elimination of the parastatal monopoly of the imports and distribution of fertilizer, phasing out of a fertilizer subsidy, and establishment of a free market system by the end of the program.

Importing and distributing of fertilizer is being liberalized as Cameroon moves toward privatization of this industry. However, the state is still phasing out a fertilizer subsidy and needs to phase out preferential interest rates for fertilizer importers and distributors. Fertilizer sales have remained about the same since liberalization. Liberalization has been beneficial and positive by stopping the waste, corruption, and inefficiencies of the parastatal company and by reducing the Government's subsidy bill by about US$ 14 million in only two years. Farmers have been protected from large price increases as the subsidies are being withdrawn by the efficiency gains from the private sector imports and distribution.

FSSRP sustainability will depend upon how the government proceeds on comprehensive structural reform program (exchange rates, fiscal deficits, banking reform etc.) as well as emergence from the current economic crisis. The FSSRP has found that, like many other projects, policy reform is a process that requires dialogue, flexibility,

expertise, networking, patience, and management intensity. Market reforms may lead to the failure of some firms; however, the benefits will be greater efficiency and economies of scale. Reforms must be carried out in comprehensive orderly manner. Reform of the input side of a productive sector such as fertilizer will probably be difficult to complete without reform of the output marketing sector such as coffee and cotton [Blaine et. al. 1991].

In biological technology transfer, the Zimbabwe hybrid seed program has achieved success with over 90 percent maize hybrid adoption by producers, and notably higher yields than for neighboring countries. The success of hybrids is attributed to breeding as well as good government support services - input delivery, credit access, favorable prices and extension [Lesser 1992]. Commerce is heavily regulated, but the restrictions are being removed. The government regulates the entire marketing system including prices, movement, and storage for maize, wheat, and white sorghum. Inputs are coordinated through farmers' organizations such as Seed-Coop, the association of commercial scale farmers or by supplier groups such as Agricultural Chemical Association. The Seed-Coop has its own breeding program and exclusive rights to hybrids developed by the government's Department of research and Specialist Services (DR&SS). New competition includes CIMMYT (1985), Pioneer Overseas Corporation (1988), Cargill Zimbabwe (1991) and Dekalb Hybrids (1991-93 joint with Seed Coop). Seed-Coop has a monopoly on seed production but private firms compete strongly on quality control, better service and improved distribution.

Seed trials are delayed because of the public sector's inability to keep up with the amount of advanced trials for their varieties due to budgetary problems. A privately funded independent Agricultural Research Trust is becoming increasingly important for the conducting the trials for the seed houses. The existence of plant breeders rights was not important in the decision of private international firms to locate in Zimbabwe because hybrid maize does not require legal protection except for the inbred lines. This may become more important in the future with wheat, barley, and millet. Seed price controls have become a thorny issue as high inflation has reduced the real price of seed from 1987 to 1989. Declining profits for seed companies and farmers are a problem [Lesser 1992, pp 2-15 and 2-16].

F. Important lessons learned

The discussion of the cases above illustrates that many lessons have been learned from donor assistance for agricultural output and input marketing service projects. The following identifies some of these important lessons.

Political stability and correct economic and financial policies create the economic environment in which the economy can perform best. Entrepreneurs will not be willing to invest and take risk with the expectation of earning profits without the correct macro-environment [World Bank 1990 and 1991; Wolgin 1990; and Jaffe 1993].

Policy reform and institutional change is a process that takes dialogue, time, and flexibility. Donor projects need to be long term oriented and stay the course to accomplish the desired result. Projects need to be flexible to adapt to changing market conditions. Too much emphasis is sometimes placed upon immediate impact and success from projects [World Bank 1990, pp 4-5; and Holtzman et al. 1992, p.18]

Reforms need to be carried out in a comprehensive and logical manner. Partial reforms will not likely succeed. There is a premium on complementarity of reform actions. Reform of input markets and financial markets that likely will increase costs to the firm without reforming output markets will ultimately fail because of reduced profit levels [World Bank 1991, pp. 148-157].

Appropriate services, profitability and timeliness of services for input and output markets are fundamental to success. More research and education is needed at the local level to ensure the development of the appropriate services, the profitability from use of the services and the timely delivery of the services to farmers [World Bank 1990].

Market liberalization and privatization can succeed. The private sector appears to have a comparative advantage in input and output marketing as well as other activities. Private firms can perform these services better and at lower cost than government parastatals [Wolgin 1990 and World Bank 1990].

Governments need to increase investments in infrastructure such as transport and communications, other public goods and "market software" such as market information and an effective legal system that facilitates the improved performance of the market system. Actual performance of most economic activity can be best performed by the private sector [World Bank 1990 and 1991].

Perhaps the best lesson from all the marketing projects reviewed is that "the clearest lessons relate to actions that should be avoided rather than to those that should be replicated. This may be because it is easier to say why something went wrong than why it went right. Successful projects tend to teach ambiguous lessons, while unsuccessful projects generally have lessons which are painfully clear." [World Bank 1990, p. 25].

VII. Conclusions and Implications for A.I.D. Investments

The purpose of this section is to answer the six questions posed in the introduction regarding the implications of this paper for future A.I.D. agricultural investments in developing countries. The ideas presented will cover the set of agricultural services defined for this paper, and will also incorporate the authors' perspectives on how investments in these services relate to other types of agricultural investments. The term agricultural services will be used for all aspects of credit, input and marketing services discussed above.

1. Are investments in agricultural services appropriate at all stages of development, or are they most appropriate during the early or later stages of growth?

The literature reviewed seems clear: there is a preferred sequencing of investments in agricultural services. The first priority is to develop an appropriate environment within which agriculture will function. This environment includes at least three key dimensions. The first dimension is infrastructure. Agriculture cannot perform well unless some rudimentary infrastructure is in place. As noted by Ahmed and Donovan (1992, p. 31), "The degree of infrastructural development is in reality the critical factor determining the success of market-oriented sectoral and macroeconomic policies in the developing world." There is little value in supplying credit or modern inputs to farmers if they lack the roads, bridges and transportation required to acquire production inputs and to transport their harvests to market. Subsidized credit or inputs can not compensate for nonexistent or poor infrastructure. The second dimension is technology. Appropriate technology must be available for farmer use. Figure 1 emphasized that the returns from using production inputs depended importantly on the response that farmers obtain from their use. Traditional technology offers little scope for a dramatic reallocation of or increase in resource use.[3] The third dimension is policy environment. Policies that directly or indirectly affect agriculture must be reasonably conducive for agricultural production and marketing. Prices, exchange rates, trade policies, and monetary and fiscal policies must provide producers with reasonable prospects for making an economic return if they adopt new technology, make investments and increase production. Otherwise, they will not take risks and try to increase production beyond subsistence levels.

Agricultural services generally represent the second priority for government support once a favorable productive environment has been created. At this stage, governments and donors can usefully make key sector-specific investments in the public goods required to support private firms engaged in farming or marketing agricultural inputs and products. For agriculture, this includes several investments such as establishing prudential regulation and supervision of financial institutions, enforcement systems for contracts and property rights, market grades and standards, and market and credit information systems. Investments are also needed in developing research and extension systems, and in the training of credit and marketing specialists, and in human capital generally. Furthermore, since private firms may underinvest in new innovations because of a lack of information or perceptions of risks, there may be a role for governments and donors to accelerate development by financing or directly conducting experiments in new credit and input delivery systems, institutions, organizations and technologies.

[3] This point was demonstrated in the seminal work of T. W. Schultz in 1964.

2. Has successful agricultural development occurred in the absence of investments in agricultural services?

No country has achieved high levels of agricultural development without investing in agricultural services. The greater the level of agricultural development, the greater the variety and sophistication of the services demanded. Countries with a large land frontier have been able to rapidly expand by simply improving transportation and communication so farmers would be induced to bring new land into production through reductions in transportation and marketing costs. This occurred in the westward expansion of the U.S., the rapid expansion of wheat and soybean production in Brazil, and in the cassava producing areas of Northeast Thailand. Once the frontier is exhausted, however, these relatively easy gains in output must be replaced by improvements in yields on existing land. Yield increases require creating and using improved biological and mechanical technology, and the successful dissemination of this new technology requires supportive agricultural services.

3. What was the rate of return to investments in agricultural services? Did investments in complementary subsectors pave the way for these returns?

Unfortunately, there is little systematic information about the real rate of return realized from investments made in agricultural services in developed countries. Furthermore, there are few rate of return studies for the investments made by governments and donors in agricultural services projects in developing countries. The returns from many donor funded projects appear to be fairly low, and certainly lower than expected by the project designers. This conclusion is based on two types of observations. First, there is evidence that many projects have failed to provide a sustainable increase in the supply of agricultural inputs, credit and marketing services. It is hard to conclusively demonstrate that aggregate output has been seriously affected when credit and marketing services disappeared once projects ended. Secondly, project completion reports often note serious problems in implementation that presumably influence their rate of return. For example, the World Bank Review (1993d) reported a general decline in agricultural project ratings during the 1980s and the problem was especially serious for credit projects. For 204 credit projects, 23 percent were rated unsatisfactory. The score for credit components projects was even worse with 47 percent rating unsatisfactory. A similar problem was reported by World Bank for agricultural marketing projects. The re-calculated ERRs for many marketing projects are substantially less than the ERRs estimated during project design.

Analysis shows that an important reason for the failure of agricultural services projects is that agriculture has been discriminated against due to the urban bias of many policy environments. Firms and institutions supplying agricultural services cannot grow and become self-sustaining unless agricultural producers can prosper. Rarely do strong support institutions exist where agriculture is weak. Projects were implemented in many cases without first ascertaining that the policy environment was conducive for agricultural growth. The sequencing of government support has also been a problem in many countries. The

early supervised credit projects ran into difficulty because they were implemented before good technology was available for farmers to adopt (Donald 1976).

A second cause for many project failures can be attributed to poor design. This has been the case with many agricultural credit input and marketing projects, and especially the frequent failure of agricultural development banks and cooperatives. In spite of the large amount of funds spent on agricultural projects, there are few examples of successful delivery systems for financial or marketing services in developing countries. The problem is most serious in those countries where agriculture is especially risky because of the natural environment and the lack of irrigation, insurance and other risk-reducing institutions.

A third important problem for many sector-specific investments is that they fall into the public goods domain and require continuous government funding. Some government and donor projects have failed not because of poor design but because their sustainability required public funding that was not continuously available because of inadequate revenue collection. This is an important reason for the harsh criticism of highly subsidized agricultural credit projects. It is also relevant for marketing projects that require large amounts of public sector funding such as market information systems. Reforms in public administration must accompany sector-specific investments to insure that necessary revenues are available when donor funding is terminated.

The success stories of agricultural development provide useful insights into the conditions necessary for a satisfactory rate of return on agricultural services projects. For example, the successful cases of production and exportation of high value agricultural commodities follow some general patterns (Jaffee 1993). These include favorable natural resources and macroeconomic policies, strong human capital, well-developed physical infrastructure, capacity to develop or adopt technology, prior or parallel development of complementary industries and a dominant role of the private sector. Governments have provided facilities and services which either have public good properties, or give rise to externalities, or exhibit large economies of scale.

4. Is the private or public sector best suited to invest in agriculture services?

The cost of credit, seeds, fertilizer, and marketing services normally should be paid by the user. Therefore, farmers should expect to pay these costs and are willing to do so when they are clearly profitable. Generally, private sector firms are best equipped to supply inputs credit and marketing services that can be sold for a profit. The weak performance of government banks and parastatal marketing boards suggest that governments often do a poor job in delivering many services. This is particularly true in countries too weak to resist strong rent-seeking groups and political intrusions in the operation of governmental agencies. On the other hand, there are investments in research, extension, and market regulation that are public goods. It is difficult for private firms to provide these services and charge users for them in order to recover costs, so they are the appropriate domain for the public sector. The exception is where private markets fail to provide services that are

socially desirable, such as marketing services for poor farmers. It is appropriate for governments and donors to support experiments leading to new institutions or instruments better designed to serve these groups, with the expectation that the private sector will eventually adopt them.

The lessons learned in this study point to areas of investment by governments and donors that may generate high payoffs. In the finance field, additional experiments are needed to test alternative designs of organizations to provide rural financial services. These include increased linkages between formal and informal finance such as the expanded use of merchants and traders to on-lend funds to agricultural producers. There is also a need to systematically evaluate the new types of village level banks and rotating savings and credit institutions that are attempting to lower transaction costs and lending risks by using local information to screen potential borrowers and enforce loan contracts. In the marketing field, there is a need to explore improving price efficiency by creating commodity exchanges, and to increase the capacity of governments to improve supply and demand projections, to conduct forecasts for imports and exports, to provide market outlook information, and to conduct research and policy analysis. There is also a need to explore ways to increase cooperation between the government and private firms in input and output marketing.

5. Among the various agencies or organizations that implement agricultural activities, are some better suited than others in providing agricultural services?

For this question, the agencies and organizations considered are banks, cooperatives, private firms, government agencies, and NGOs. Some agencies have a clear advantage in providing services compared to others. Commercial banks have the best record in providing sustainable financial services, and in some cases cooperatives and credit unions have also been successful in developing countries. Credit unions have been particularly successful in some developing countries in the mobilization of savings from poor people. Most NGO credit programs are highly subsidized, however, and have questionable long-term viability without continuous heavy subsidization. Private firms generally have a better track record than government agencies in providing efficient and timely inputs and marketing services. Some cooperatives have been successful in this area, but many have failed. Several private firms have also been effective in providing technical assistance to farmers in conjunction with the products they sell.

Historically, government agencies have provided the basic infrastructure of transportation and communication, and research, education and extension services. Today, more and more of these functions are being evaluated for privatization. An unanswered question is how well will poorer farmers be served in completely privatized systems. Governments will continue, however, to play a key role in setting the "rules of the game" for the private sector through regulatory and supervisory activities. A debatable point is the extent to which NGOs can really substitute for the government in providing public goods. NGOs have a comparative advantage in identifying with their clients, articulating their needs, organizing them into groups, and experimenting with alternative delivery systems. On the other hand,

the social orientation of many NGOs results in unbusinesslike and inefficient operations. Linking NGOs with government or other types of organizations may be a promising way to gain the advantages of both.

6. Does the U.S. have a comparative advantage in assisting in the provision of agricultural services in developing countries?

The U.S. has a clear comparative advantage in transferring the techniques and institutions necessary to supply agricultural credit and marketing services to those developing countries committed to a market economy. The U.S. is recognized as having built an efficient system of sustainable private and cooperatively owned firms that supply good quality inputs and credit and marketing services to a large and heterogeneous agricultural producing and marketing sector. Researchers have studied and documented this system, and their analysis is available for other countries to evaluate. Furthermore, many of the key participants in the sector are prepared to directly assist developing countries to design and introduce a system appropriate for their specific needs. Some private firms and cooperatives are already actively involved in making direct investments and transferring technology to those countries with the greatest market potential.

In summary, there is a large scope for U.S. involvement in supporting agricultural development in low income countries and emerging market economies. This involvement is not likely to stress huge capital transfers for infrastructure development. Experience has shown that where the basic economic environment is conducive for agriculture, the U.S. can help to finance sector-specific investments and design the technology and institutions necessary to provide agricultural support services in a market economy. The provision of agricultural inputs and credit and marketing services will be especially important in those developing countries that have exploited their agricultural frontiers and must now tackle the difficult task of improving agricultural productivity.

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